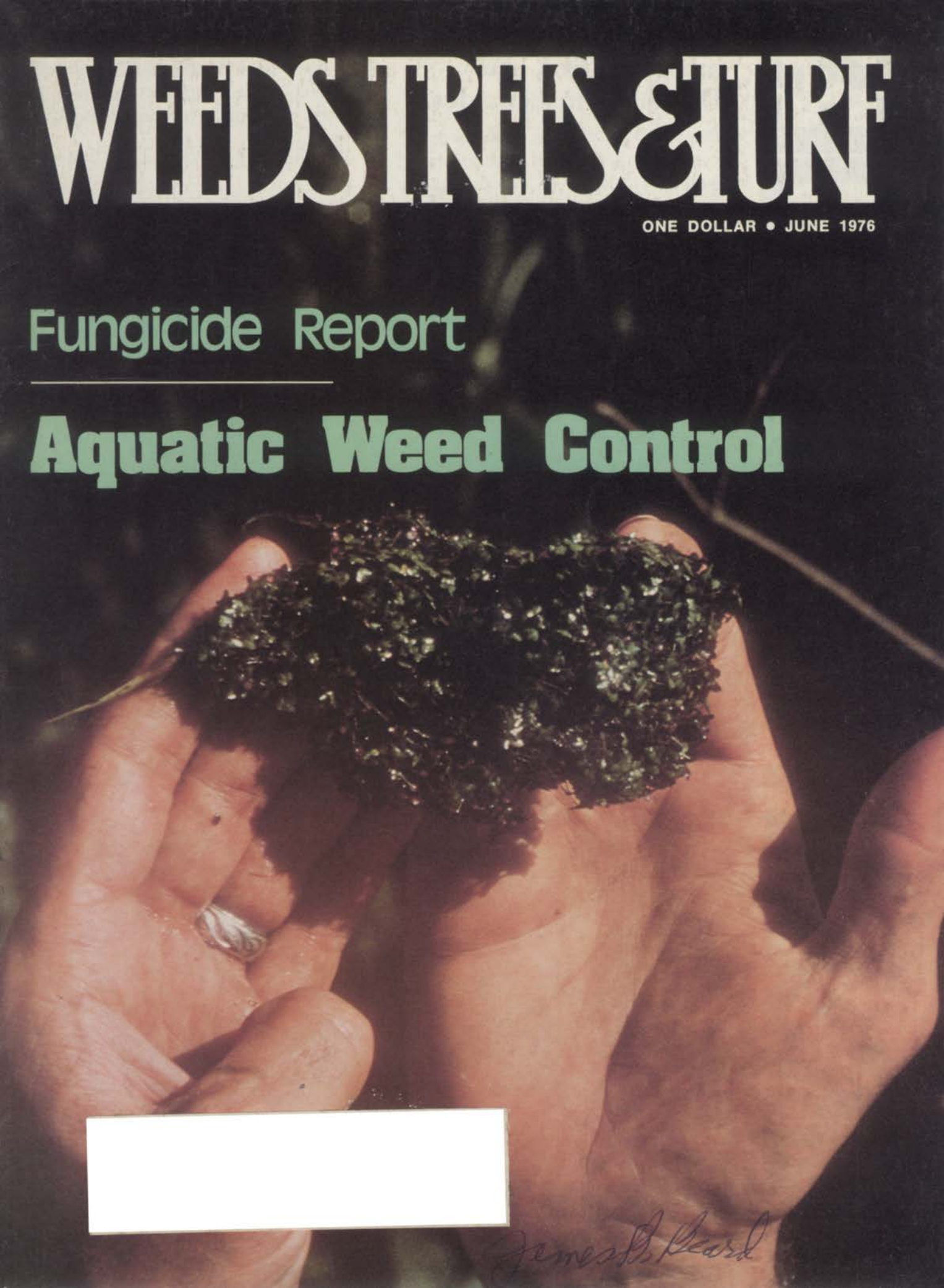
WEEDS TREES & TURF

ONE DOLLAR • JUNE 1976

Fungicide Report

Aquatic Weed Control



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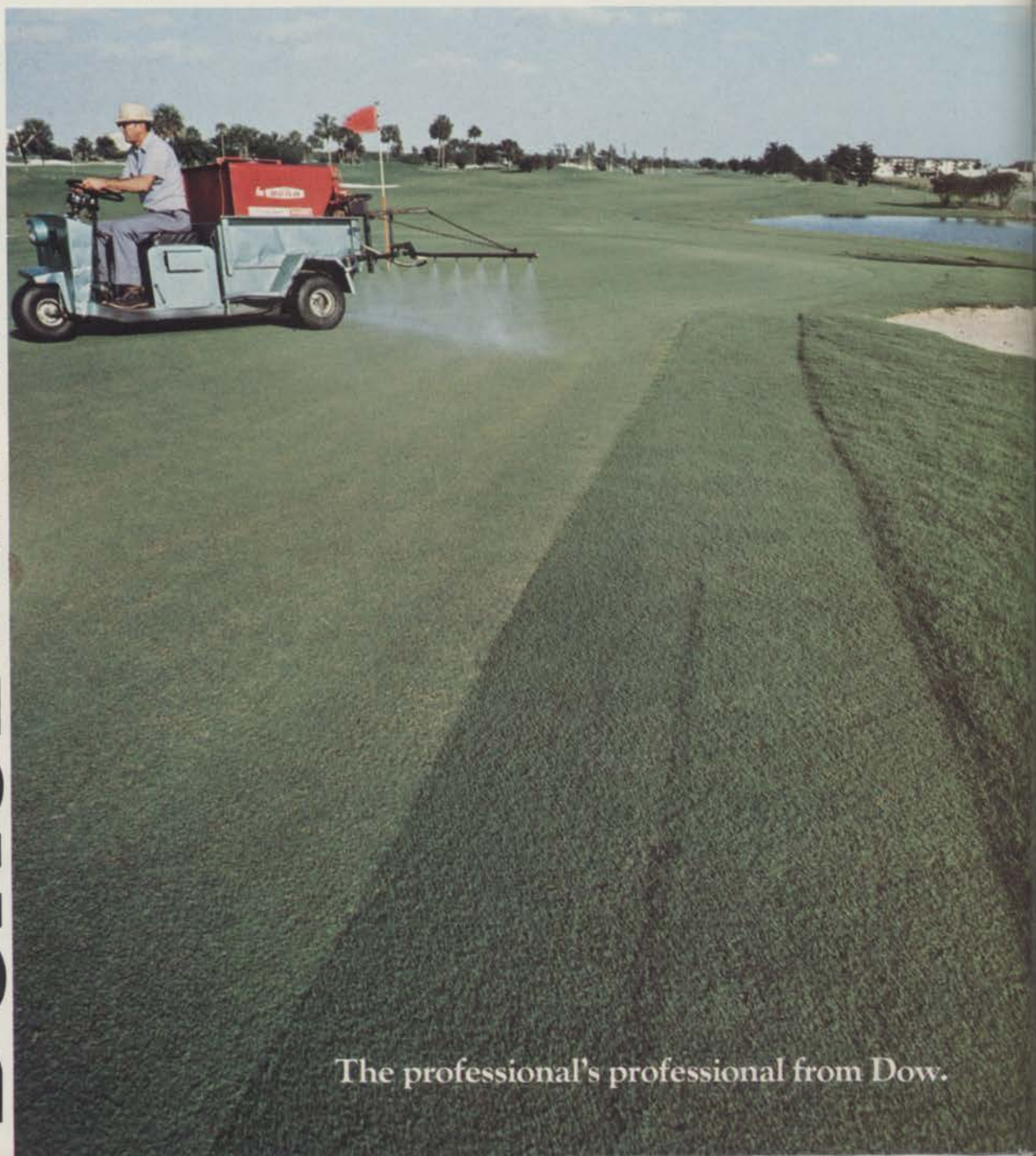

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WEEDS TREES & TURF®

June 1976, Vol. 15, No. 6

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The Cover — Duckweed growth (story on page 28) consists of myriad individual plants which form a choking mass, cutting off light and oxygen and endangering fish life.

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Government News

The Noxious Weed Act of 1974 gives the Agriculture Department authority to regulate noxious weeds at port on entry. Proposed regulations announced recently enumerate seven aquatic weeds, two parasitic weeds and 13 terrestrial weeds unknown or not widely distributed in the U. S. Special permits for movement of these weeds into or through the U. S. may only be granted when rigid regulations covering shipment, storage and destruction are adhered to, the American Association of Nurserymen reports.

The aim of the federal Environmental Protection Agency "is not -- and never has been -- to 'get' pesticides," EPA administrator Russell E. Train said recently in a speech to the American Pesticide Control Officials in Washington, D. C. He recommended pesticides be found that affect only specific pests and then break down quickly once their job is done; that combinations of natural and chemical control of pests be relied on more; and that growing amounts of municipal and other wastes be utilized to replenish the soil.

Grass seed prices have been extremely depressed since at least 1974, according to Doyle Jacklin, Vaughan-Jacklin Seed Co., Spokane, Wash. He spoke earlier this year at the winter meeting of the American Sod Producers Association in Clearwater Beach, Fla. and said that at the time most prices were below the cost of production. The reasons for this were the depressed economy, low housing starts and record seed production. This, coupled with the fact that last year was a boom year for grain, soybean and vegetable crop seeds makes the situation grim for grass seed growers in some cases. Jacklin says price recovery will be slow and gradual through next year for his industry. He also said no new varieties will be planted, but some earlier plantings will come to harvest later this year.

A new agricultural safety standard from the Occupational Safety and Health Administration went into effect June 7. The new ruling deals with guarding and shielding of moving parts. It applies primarily to manufacturers, requiring a variety of guards and shields be provided after that date.

In the chlordane/heptachlor situation, the Environmental Protection Agency will pursue the recall of the products despite Velsicol Chemical Corporation's insistence the recall is illegal. The EPA answered a letter from the Chicago company by saying the recall is not mandatory, and that this is widely known in the industry. Velsicol says it is doubtful the EPA will take specific legal actions to enforce the recall, but if they should, the company will take necessary legal steps "to protect our rights."

The Justice Department has charged that Union Carbide Corp. has illegally restrained the sale of carbaryl insecticides in a civil antitrust suit filed in San Francisco. Carbaryl is marketed under the trade name Sevin. The suit alleges Union Carbide, Salinas, Calif. prohibits purchasers of carbaryl from selling it in its pure form and requires them to formulate only those carbaryl insecticides Union Carbide specifies.

PRO4 Diamond Shamrock

DACONATE® 6 controls nutsedge, goosegrass and chickweed

Daconate 6 is the hot-weather, postemergence herbicide that won't harm bermudagrass, bluegrasses and zoysiagrass when used according to label directions. Controls nutsedge, crabgrass, goosegrass, bahiagrass, chickweed, barnyardgrass, wood sorrel and sandbur.

A ready-to-use liquid, Daconate 6 is a 6-lb per gallon MSMA plus surfactant. A swift, sure end to grassy problem weeds.

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Members of the recently formed Industry Advisory Council of the Golf Course Superintendents Association of America met at GCSAA headquarters in Lawrence, Kan.: (from left, first row) President Richard Malpass, Portland, Ore.; Vern Worrel, Cushman-Ryan; Jim Watson, Toro; and executive director Conrad Scheetz; (second row) Vice President Ted Woehrle, Birmingham, Mich.; George Horn, O. M. Scott & Sons; Jim Latham, Milwaukee Sewerage Commission; and Ted Smith, Smithco; (third row) Tom Haschen, Du Pont; director Lou Haines, Denver; Bob Moore, Aquatrols; director Gordon Witteveen, Toronto; and John Kinkead, National Mower.

Radko Is National Director Of USGA Green Section

Alexander M. Radko has been appointed a national director of the United States Golf Association Green Section.

He will head up a scientific team of agronomists in bringing the soundest turf management counseling possible to USGA member clubs. A number of new activities are being planned for the turfgrass service of the Section and Radko also plans to devote additional time to turfgrass research projects sponsored by the organization. He has been with the USGA since 1947 and served as the eastern director for 22 years.

Maryland Turf Association Publishes Sod Directory

The Maryland Turfgrass Association and the Maryland Department of Agriculture have released teh first edition of a *Pick Up Your Own Sod* directory.

The directory lists 39 Maryland sod growers who sell to customers on a direct basis. This new sod sales program outlined in the book is new to most of the growers this year.

The directory includes information on types of sod and has complete installation instructions. Persons wishing a copy should send one 13-cent stamp and their address to: *Pick Up Your Own Sod,"* Maryland Department of Agriculture, Parole Plaza Office Building, Annapolis, Md. 21401

Course Maintenance Costs Up Nine Percent in 1975

Golf course maintenance costs for 100 selected clubs with 2,124 holes of golf were 9.3 percent greater in 1975 than in 1974, and net golf expenses showed an overall advance of 8.9 percent, according to a recent study released by Harris, Kerr, Forster and Company, certified public accountants.

On a per-hole basis the 1975 maintenance costs averaged $7,962. Payroll and related costs averages $5,318 (67 percent); all other expenses averaged $2,644. The results were reported in the National Golf Foundation April Golf Market Report.

Suggestions for Pay Wage For Summer Help Given

How much do you pay your summer help? Larry Bunn, superintendent at Blue Hill Country Club in Massachusetts did an informal poll recently; here are his results:

The low starting salary was $2.30 an hour to a high of $3 an hour. The average starting pay for summer help was $2.60 an hour. Pay for summer help who returned each year or experienced help ranged from a low of $2.75 to a high of $3.30 an hour. Their average pay was about $3 an hour.

Hopkins Chemical Acquires Allied Pesticide Department

Crown Chemicals, St. Louis-based pesticide manufacturer and distributor, has announced the acquisition of Allied Chemical Corp.'s pesticide department by Hopkins Agricultural Chemical Co., Crown's parent company.

Crown now offers, as additions to its line of herbicides and spray adjuvants, the Urox family of monurono-TCA and bromacil soil sterilants and Plyac spreader-sticker.

Sod Producers Convention July 21-23 in Rhode Island

The American Sod Producers Association will meet July 21-23 in Newport, Rhode Island for its annual summer convention and field days. The Treadway Inn is headquarters hotel.

Chairman of the event is Chris Beasley of Tuckahoe Turf Farms, Canton, Mass. The format will follow previous years, with commercial displays and an open house Wednesday night July 21 in the exhibit area of the Treadway, as well as a free continental breakfast in the area Thursday morning for all participants.

The same morning, the business of the Associaiton will be conducted and the afternoon of Thursday and all day Friday will be spent in the field.

please turn page

For ad on following page Circle 112 on free information card

It's good! Pick it up.

It's better than good—it's great! USS Vertagreen Tee-Green Technical Turf Food is designed and formulated specifically for proper fertilization of golf course tees, greens, and aprons. It has an analysis of 16-4-8, and half of the available nitrogen is from urea-formaldehyde.

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*Screen sizing: 90% Minus 10 Plus 20 Mesh U.S. Sieve

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Herbicide Facility Expansion Announced by Monsanto

Monsanto Co., St. Louis, Mo., has announced a multi-million dollar expansion of its Roundup herbicide production facilities in Luling, La. The expansion, expected to be onstream early next year, will double capacity of the initial herbicide production unit in Luling which became operational early this year.

Richard J. Mahoney, corporate vice president and managing director of Monsanto Agricultural Products Co., said the increase in the herbicide production capacity is being made to meet anticipated heavy demand. "Its introduction earlier this year for major crop use in the United States and Canada is expected to greatly accelerate demand," Mahoney told WEEDS TREES & TURF.

Landscaping Adds Dollars To Home Property Value

The presence of trees around a house may enhance the value of that property by as much as 20 percent, with an average increase of five to 10 percent. This can translate to a $3,000 to $7,000 jump in the home's selling price.

So says Dr. Brain R. Payne, United States Forest Service environmental researcher at the University of Massachusetts, Amherst, one of the scheduled speakers at New Horizons' Day to be held during the 101st Annual Convention and Exhibit of the American Association of Nurserymen July 10-14 at the Sheraton-Boston.

Dr. Payne has done considerable research on the subject and has found landscaping around a house appears to have a tangible effect on its marketability.

Bronze Birch Borer Control By Spraying in Early June

Wilting or crown diebacks are signs of the bronze birch borer at work. If your birch trees showed these symptoms last year, spray in early June to control the pest this year.

"The bronze birch borer adult is a small, dark, metallic beetle," says Jim Liebherr, Michigan State University entomologist. "The adults emerge from infested trees in early June and lay their eggs. When the larvae hatch, they bore into twigs and branches and feed there. It is this boring that causes the damage."

To be sure the wilting is caused by the bronze birch borer, examine the wilted branches. Rusty or reddish brown trails on the bark just below the wilted part are sure signs the pest is present.

Once the larvae are under the bark, you cannot touch them with insecticides, Liebherr points out, so your best chance to control the pest is in June when the adult beetles emerge.

Begin controlling the bronze birch borer by pruning out dead limbs and branches in May. Burn or haul away these branches — they may be sheltering the insect.

Following all label directions, spray bark and branches with a lindane spray about June 7 and again 10 to 14 days later. This treatment will help control the adult beetles and prevent egg laying on your tree.

Healthy trees are less likely to be attacked by the beetle than unhealthy ones, Liebherr notes. To minimize the danger of borer damage, water and fertilize birch trees to keep them growing vigorously, Liebherr advises.

Chemical and Turf Division Established by Ramsey Seed

A new chemical and turfgrass division has been formed by Ramsey Seed, Inc., Manteca, Calif., to provide turf seed mixtures and chemical algae and herbicide control for golf courses, parks and other landscape projects.

Larry Evans will serve as manager of this new division, according to President W. H. Ramsey. Evans has directed chemical product sales for Ramsey Seed for the past four years, including Curtrine for aquatic algae control.

Ramsey Seed is one of California's processors and wholesale distributors of a broad line of grass and clover seeds for landscape and agriculture planting. Its products include such widely used landscape seed varieties as Blando Brome, Annual Clovers, Lana Vetch, and turfgrass seeds.

The new division will provide seed mixes of these and other varieties to individual specifications, and will assist project managers in developing blends that best fit local soil and climatic conditions.

Seeds in these mixes can be coated with Pel-Kote, if desired. This Pel-Kote process places amounts of specific strains of rhizobia around clover seeds, to assure proper inoculation with nitrogen-fixing bacteria. It also places a nutritive coating around both clover and grass seeds, to improve germination and seedling vigor by creating an optimum micro-environment around individual seeds.

The division's Cutrine-Plus is a highly effective chemical that controls chara, nitella, and other algae that grow on the bottom; also, filamentous algae that grow on the surface. It both controls and restores the beauty and usefulness of water in ponds and reservoirs.

Weedtrine-Plus is effective in controlling a broad range of aquatic plants and algae.

Slide-Cassette Presentation Developed by Sod Producers

The American Sod Producers Association board of trustees has authorized production of a slide-cassette presentation to be utilized by members as a promotional tool.

The project is now well underway with initial script and slide designations already reviewed by the board. The presentation is being developed by Lew Cole Enterprises of Grand Island, Neb., which has had wide experience in the audio-visual field and has produced a number of similar promotional presentations for major manufacturers and business groups.

Upon completion of the project, the five-minute presentation will be made available in sets to the individual members for use with their particular customers and points out the value of sodding, including aesthetic, economic and the practical aspects related to the use of sod in a variety of ways.

to page 46

Diazinon. The one broad-spectrum turf insecticide with the label to prove it.

The surest way to control the most turf insects, with one insecticide, is to spray the one that's labelled for the most insects. That insecticide is Diazinon.® The one broad-spectrum turf insecticide. With the label to prove it.

Controls 21 turf insects. More than all the other common turf insecticides combined.

Insects	Rate per 1,000 sq. ft.		Remarks
	Diazinon AG500	Water	
Lawn Chinch Bugs	2-3 fl. oz. or 3-6 fl. oz.	25 gals.*	Use higher rate for longer residual control and in lawns of dense growth, such as St. Augustine lawns.
Ants, Armyworms, Clover mites, Springtails (Collembola), Crickets, Cutworms, Digger wasps, Earwigs, Frit flies, Lawn billbugs, Sod webworms (Lawn moth), Sowbugs, White Grubs (such as Japanese Beetle larva)	4 fl. oz.	3 gals.	Spot spray anthills and wasp ground nest openings. For lawn billbugs and grubs, irrigate the lawn thoroughly immediately after treatment. For frit flies, mow grass and water well before treatment but delay application until grass is dry. Do not water again until necessary.
Brown dog ticks, Bermuda mites, Chiggers, Fleas, Leafhoppers	1¼ fl. oz.	3 gals.	Do not apply to animals. For brown dog ticks spray grass and under shrubbery, particularly near house.
Millipedes	8 fl. oz.	3 gals.	
Rhodesgrass Scales	5 fl. oz.	25 gals.*	Apply when crawlers first emerge.

*Application may be made in 3 gals. of water per 1,000 sq. ft. Thoroughly water treated area immediately following application.

Bear in mind, the actual label has a lot more information you need to know.

If you'd like to have a copy of the complete Diazinon AG500 or 4E label, pick up one from your local supplier. Or write us.

Agricultural Division, CIBA-GEIGY Corporation, P.O. Box 11422, Greensboro, NC 27409

Diazinon

Turf Renovation Without Tillage

by G. B. Triplett, Jr.
and M. H. Niehaus
Ohio Agricultural Research
and Development Center

Several reasons exist for renovation of turf areas. These include introduction of improved grass cultivars, reestablishment of grasses killed by weather, disease or insects and elimination of undesirable plants. Traditionally, renovation has involved tillage with a plow or rotavator and reseeding. This requires considerable effort, creates an erosion hazard on sloping sites and a loose seedbed that must be mulched and kept free of traffic until the new seeding is established. Also, perennial weedy grasses are frequently not controlled by tillage.

We have been able to successfully renovate turf areas by spraying herbicides to kill existing vegetation, dethatching or verticutting, and reseeding. If there is no reason to change the existing grade, this method may have several advantages over traditional methods that involve tilling the soil. Much less effort is required and the reseeded area will support traffic much sooner since the soil is not loosened. The erosion hazard is almost negligible even on sloping areas. As a bonus, few buried weed seeds are exposed, creating less of a weed problem in the new seeding, stones in the soil are not turned up, and straw mulch is not required for the new seeding. As with traditional methods, certain principles must be observed and definite procedures followed to insure successful renovation. The existing vegetation must be killed, most of the thatch removed, and seed planted in contact with soil. The seedings that we have made have been quite satisfactory.

The original problem that created poor turf condition must be corrected for renovation to be successful. If the poor turf was caused by excessive shade, poor drainage or too much traffic, these problems must be corrected before renovation will be satisfactory.

Killing existing vegetation. The herbicide glyphosate has been quite effective for killing existing vegetation in our trials. It is a broad spectrum herbicide effective on both grasses and broadleaf plants and with no residual activity in the soil. When properly applied, it is translocated and kills underground parts of plants as well as the tops. To be used effectively it should be applied to the foliage of actively growing plants and may not give satisfactory kill of plants that are under moisture stress or dormant. One application of it may not eradicate some hard to kill perennials such as quackgrass but is usually more effective on these perennials than one or two tillage operations. After herbicide application, dethatching should be delayed from three to five days to allow the chemical to translocate into underground parts of the plants. It will have no effect on weed seeds germinating after seedings are made.

At present, Roundup by Monsanto Co., St. Louis, Mo., is labelled for use in non-crop areas and for application before emergence of wheat, oats, barley, sorghum, corn, and soybeans. Applications to turf areas followed by seeding has not yet been approved, although in our studies we have had excellent control of species present at time of spraying and no evidence of injury to seeded species. Even high rates of it applied at time of seeding have not affected establishment of several turfgrass species. It should not be used for turf renovation until approval for this purpose is obtained.

Dethatching. Established turf areas are often covered with thatch that varies in thickness, and most of this must be removed. The dethatcher should be operated until 10 to 30 percent bare soil is exposed and the debris removed. This may require several passes over the area with the dethatcher, and machines equipped with blades to slice the thatch are probably the most effective.

Seeding. In seeding, good seed-soil

contact is important and seeds falling on top of thatch will grow poorly or not at all. We have operated core aerifiers prior to seeding and later observed a tuft of grass seedlings growing in holes made by the aerifier. More effective, however, are vertical slicers adjusted to cut through remaining thatch and into the soil beneath. The blades should loosen the soil to a depth of ¼ to ½ inch and leave an open slit. Seeds falling into this shallow trench are in an excellent position to grow well when moisture and temperature conditions are satisfactory for germination. Seeders that slice the soil and drop seeds into the slit made by the knives are available.

A definite, stepwise procedure should be followed for successful renovation.

- Kill old vegetation. Be sure the plants in the area to be renovated are actively growing. If the renovation is performed in late summer, fertilization and irrigation may be necessary to insure active growth. For spring renovation, delay spraying until vegetation is actively growing and has been mowed at least once. Do not mow for several days before herbicide application to insure adequate leaf area for herbicide uptake. When approved, spray with two quarts per acre glyphosate in 30 to 40 gallons per acre water (1.5 oz. in three to four quarts water per 1000 square feet). Be careful when walking or moving equipment from areas freshly treated to untreated areas. Herbicide can be carried by traffic to untreated area and cause injury. We have had no problem with transporting the herbicide after a rain or for traffic delayed for several hours after application.
- Dethatch. Wait three to five days after spraying and operate the dethatcher to loosen and remove enough thatch so that 10 to 30 percent bare soil is exposed. Enough cover should be left to insure good footing for traffic when soil is moist. If thatch is completely removed in some areas, mulching may be necessary for a satisfactory seeding. Delaying the thatching operation less than three days will not reduce germination of seeded species, but may result in less than satisfactory kill of vegetation.

Verticutting.

- Fertilize. Using soil test information as a basis, apply lime and fertilizer needed for satisfactory grass growth. If more than 500 pounds fertilizer is required per acre, split the application and apply ½ after grass is established.
- Seed. The last dethatching operation should leave grooves cut into the soil as a site for seed placement. Seeders equipped to cut grooves and drop seeds in the slots are good for renovation operations. Seed with cultivars and rate recommended for your area. Drag or rake seeded area lightly to provide some coverage of seeds.

While weeds germinating after seeding have been less of a problem in our trials than for conventionally prepared seedbeds, crabgrass has been present in some of our spring seedings. Suitable preemergence herbicides may be used if weed problems are anticipated.

In our renovation trials, we have seeded various Kentucky bluegrass cultivars with excellent results. The new plant becomes established at approximately the same rate expected for seedings made in conventionally prepared seedbeds. Ryegrass might be added to the seed mixture if quick cover is desired. We have not felt that a moderate amount of traffic was detrimental to the new seeding. Certainly, there is less of a problem with tracks in the seeded area because of the firm soil and little problem with tracking mud when the soil is moist as compared to conventional methods.

With the effective herbicide for vegetation control that has recently become available, renovation of turf areas should be possible with less effort and problems than for systems involving tillage. □

Closeup of area after verticutting.

Plugging and debris removal.

Closeup of cored and verticutted area.

Soil after preparation.

Final product.

Fungicide Report

The basis for this report on turf fungicides is simple and to the point. WEEDS TREES & TURF went to the major manufacturers and asked them "what do you have on the market and what can it control?" The checklist we have prepared follows.

Mallinckrodt, Inc., St. Louis, Mo., manufactures a number of fungicides. Cadminate can control dollar spot, gray snow mold, copper spot and red thread. Calo-Clor can control brown patch, dollar spot and snow mold. Calo-Gran can control snow mold. Fungo 50 can control brown patch, dollar spot, copper spot, red thread, *Fusarium* patch, *Fusarium* blight and stripe smut. Koban can control *Pythium* blight, cottony blight, grease spot, spot blight and damping-off. Kromad can control brown patch, dollar spot, red thread, copper spot, *Helminthosporium* leaf spot and *Curvularia* leaf spot. Thiramad can control brown patch, dollar spot and snow mold.

Scotts ProTurf, Marysville, Ohio manufactures nine fungicides. ProTurf Fertilizer Plus DSB Fungicide can control dollar spot, brown patch and *Fusarium* patch. ProTurf Broad Spectrum Fungicide can control brown patch, red thread, copper spot, dollar spot, snow mold, leaf spot, *Fusarium* patch and moss. ProTurf Fertilizer Plus Fungicide can control brown patch, red thread, *Fusarium* patch, snow mold, dollar spot, leaf spot, copper spot and moss. ProTurf 101V Broad Sectrum Fungicide can control *Helminthosporium* leaf spot, dollar spot, brown patch, copper spot, *Curvularia* leaf spot, rust, *Alternaria* leaf spot in dichondra, and *Gleosporium* in dichondra.

ProTurf Fungicide III can control brown patch, dollar spot, leaf spot, red leaf spot, melting-out, gray snow mold, copper dichondra and rust.

ProTurf Fungicide II can control *Pythium* blight and gray snow mold. ProTurf FF II can control stripe smut, leaf spot, brown patch on St. Augustine grass, bahiagrass and centipedegrass, rust, snow mold and dollar spot. It is not for use on bentgrass, zoysiagrass and dichondra, and it contains fertilizer.

ProTurf Systemic Fungicide can control brown patch, dollar spot and copper spot. ProTurf California Fertilizer Plus Fungicide can control brown patch, red thread, *Fusarium* patch, dollar spot, snow mold, leaf spot, copper spot and moss.

TUCO, Division of Upjohn Co., Kalamazoo, Mich., manufactures Acti-dione TGF, Acti-dione Thiram and Acti-dione RZ.

Acti-dione TGF can control dollar spot, melting-out, fading-out, rust, powdery mildew and leaf spot. Acti-dione Thiram can control dollar spot, fading-out, gray leaf spot, *Helminthosporium* leaf spot, large brown patch, melting-out, pink patch, powdery mildew, rust and snow mold. Acti-dione RZ can control large brown patch, melting-out, rust, dollar spot, fading-out, grease spot, powdery mildew, *Helminthosporium* leaf spot and gray leaf spot.

Rhodia, Inc., Monmouth Junction, N.J., manufactures three products from its Agricultural Division for control of turf diseases.

Chipco Thiram 75 can control large brown patch, dollar spot and gray snow mold. Chipco Spot Kleen can control dollar spot, copper spot, large brown patch, *Fusarium* blight and stripe smut. Chipco Microgreen Liquid is a blend of iron, zinc, manganese and copper and it corrects turf yellowing, or chlorosis, caused by metal nutrient deficiencies.

Rohm and Haas Co., Philadelphia, manufactures Fore for turf and ornamentals. It can control 10 turf diseases, including copper spot, *Fusarium* blight, red thread, slime mold, *Helminthosporium* melting-out, *Rhizoctonia* brown patch, rust, *Pythium*, dollar spot, *Fusarium* snow mold and algae.

W. A. Cleary Corp., Somerset, N.J., manufactures nine fungicides.

3336 Systemic Turf Fungicide can control dollar spot, copper spot, brown patch, red thread, *Helminthosporium*, *Fusarium roseum*, and stripe smut.

Bromasan is a blend of 3336 and thiram and can control *Rhizoctonia* and *Helminthosporium* and can give excellent control of dollar spot and copper spot.

Caddy can control dollar spot and copper spot. It has also been successful in controlling snow mold, the company reports.

Granular Turf Fungicide can control snow mold, copper spot, dollar spot, leaf spot and brown patch.

PMAS (10&%) is a dual purpose herbicide/fungicide that can control dollar spot, snow mold, copper spot and brown patch. Cad-Trete can prevent and control dollar spot, copper spot, snow mold, brown patch and *Helminthosporium*.

Spotrete is a wettable powder fungicide that can control dollar spot, brown patch, large brown patch and snow mold.

Spectro can control dollar spot, copper spot, brown patch and leaf spot. Sno-Chek can control snow mold.

Diamond Shamrock Corp., Cleveland manufactures Daconil 2787. It can control copper spot, dollar spot, brown patch, leaf spot,

to page 18

PRO4 Diamond Shamrock

DACONIL 2787® pours it to nine fungus diseases

Broad spectrum Daconil 2787 fungicide controls nearly all of the fungus diseases found on golf greens, tees and fairways, as well as many ornamentals.

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Nine Turf Diseases

Curvularia **leaf spot:** Frequently, new growth at the tips remains green. Older leaves become chlorotic; eventually they turn brown and die. Susceptible grasses — centipedegrass, zoysiagrass and bermudagrass.

Brown patch: Occurs in more or less circular areas varying from a few inches to several feet in diameter. Affected leaf blades first appear water-soaked and dark-colored, then wilt and become light brown as tissue dies.

Copper spot and dollar spot: With copper spot, spots first appear as small red to brown water-soaked lesions becoming strawcolored with purple borders and elongated. Diseased leaf blades usually covered with copper-colored fungus spores.

Stem rust: Small, elongated brick-red pustules of spores on leaves. Lesions may be surrounded by a green, yellow or brown border depending on age of pustule and susceptibility of the grass.

Dollar spot: Lesions are light tan with a reddish brown border and may extend downward from the leaf tip to an inch or more in length. Stems may also be affected. In early morning, when grass is wet, wisps of white fungus ***mycelium*** or threads may be observed on diseased turf.

Red thread: Coral-pink to red fungus strands may be seen on leaves and leaf sheaths binding leaves together. Affected turf areas are more or less circular and vary from two to 15 inches in diameter. When dry, the pink strands resemble red threads.

Helminthosporium **leaf spot:** Symptoms include general thinning out of grass in scattered areas. Often, general browning is evident on affected plants. Circular to elongated purplish, brown to dark brown, or reddish brown spots with white, tan brown or straw-colored centers on leaf blades, sheaths and stems.

Gray leaf spot: Lesions are round to oval, gray with brown or purple borders on leaf blades. Under warm, humid conditions, spots may be covered with gray mold. Lesions on stem are gray to brown.

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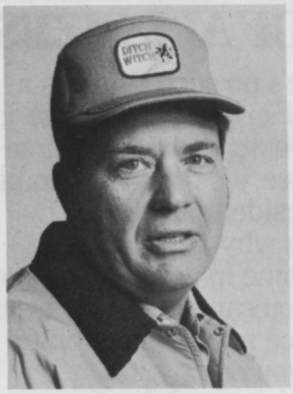

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Fungicide *from page 14*

melting-out, going-out, leaf blotch, gray leaf spot, stem rust, *Curvularia* fading-out and leaf spot.

Chemagro Agricultural Division of Mobay Chemical Corp., Kansas City, Mo. manufactures Dyrene and Dexon.

Dyrene can control brown patch, copper spot, dollar spot, leaf spot, melting-out, rust and snow mold. Dexon can control cottony blight.

Du Pont Co., Wilmington, Del. manufactures Tersan 75, Tersan 1991, Tersan LSR and Tersan SP. Tersan 75 can prevent and control large brown patch, dollar spot and snow mold.

Tersan 1991 is recommended for control of dollar spot, large brown patch, *Fusarium* patch (pink snow mold), *Fusarium* blight and stripe smut.

Tersan LSR is recommended for control of leaf spot diseases incited by *Helminthosporium spp.*, rust, and *Rhizoctonia* brown patch on turf. Tersan SP is recommended for control of snow mold and *Pythium* blight.

Stauffer Chemical Co., Westport, Conn., manufactures Captan 50-WP. It can control brown patch, damping-off, leaf spot, fungus root rot and melting-out.

The Agricultural Products Division of **Olin Corp.**, Little Rock, Ark. manufactures Terrazole soil fungicide and Turfcide 10 percent granular fungicide.

Turfcide can control brown patch. Terrazole controls *Pythium* fungus that cause cottony blight, spot blight, grease spot and damping-off on turf; and *Pythium* as well as phytophthora fungi which cause root and stem rot and damping-off on ornamentals.

Elanco Products Co., Indianapolis, has received an experimental permit for turf for its EL-222. It is not on the market.

Market planning manager of specialty products Dan Lynch told WEEDS TREES & TURF it is formulated as a wettable powder and as an emulsifiable concentrate for turf use. He said tests have shown that it can control dollar spot, brown patch, striped smut, *Fusarium* blight and snow mold. □

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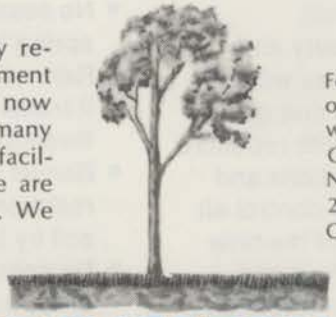

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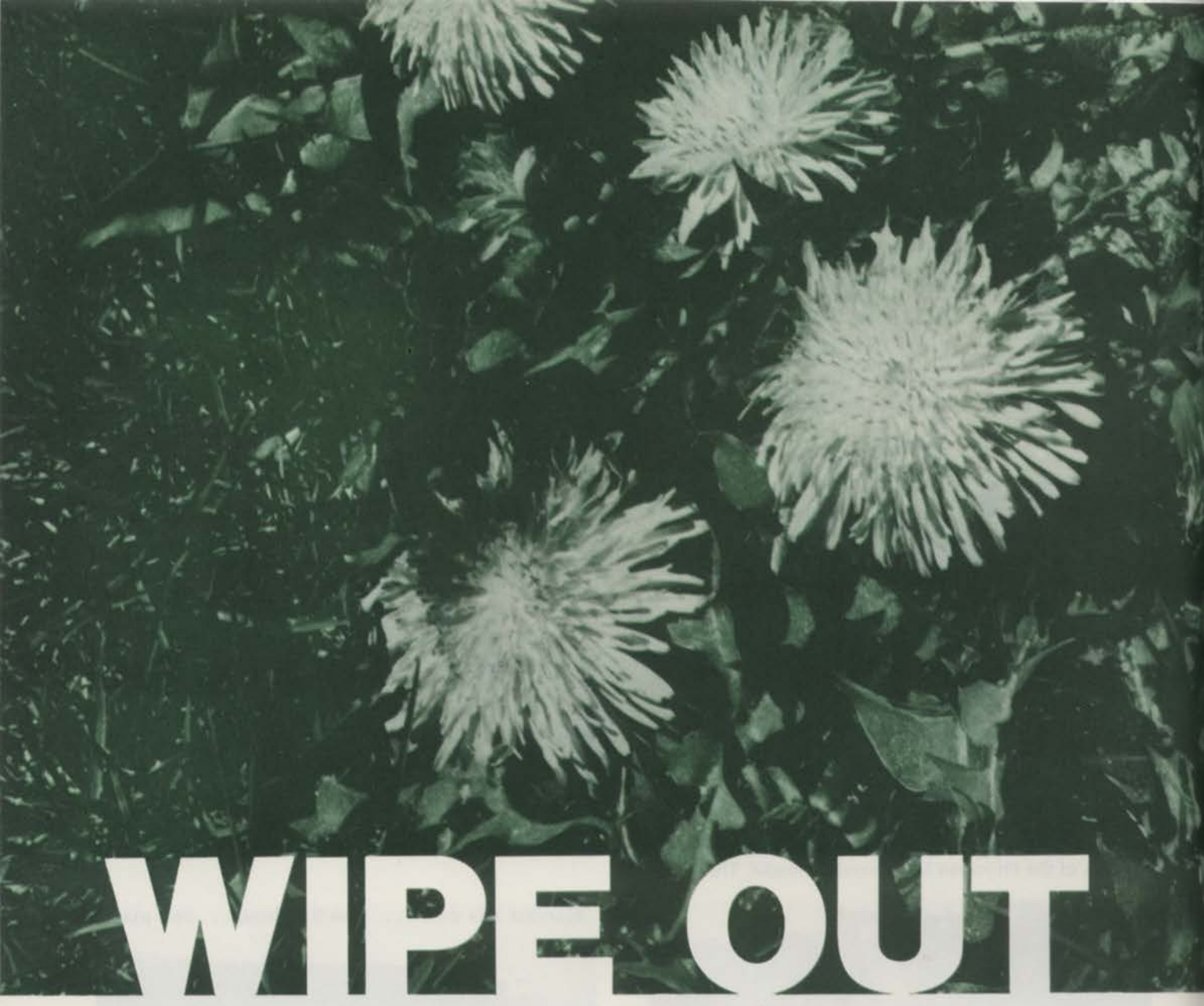


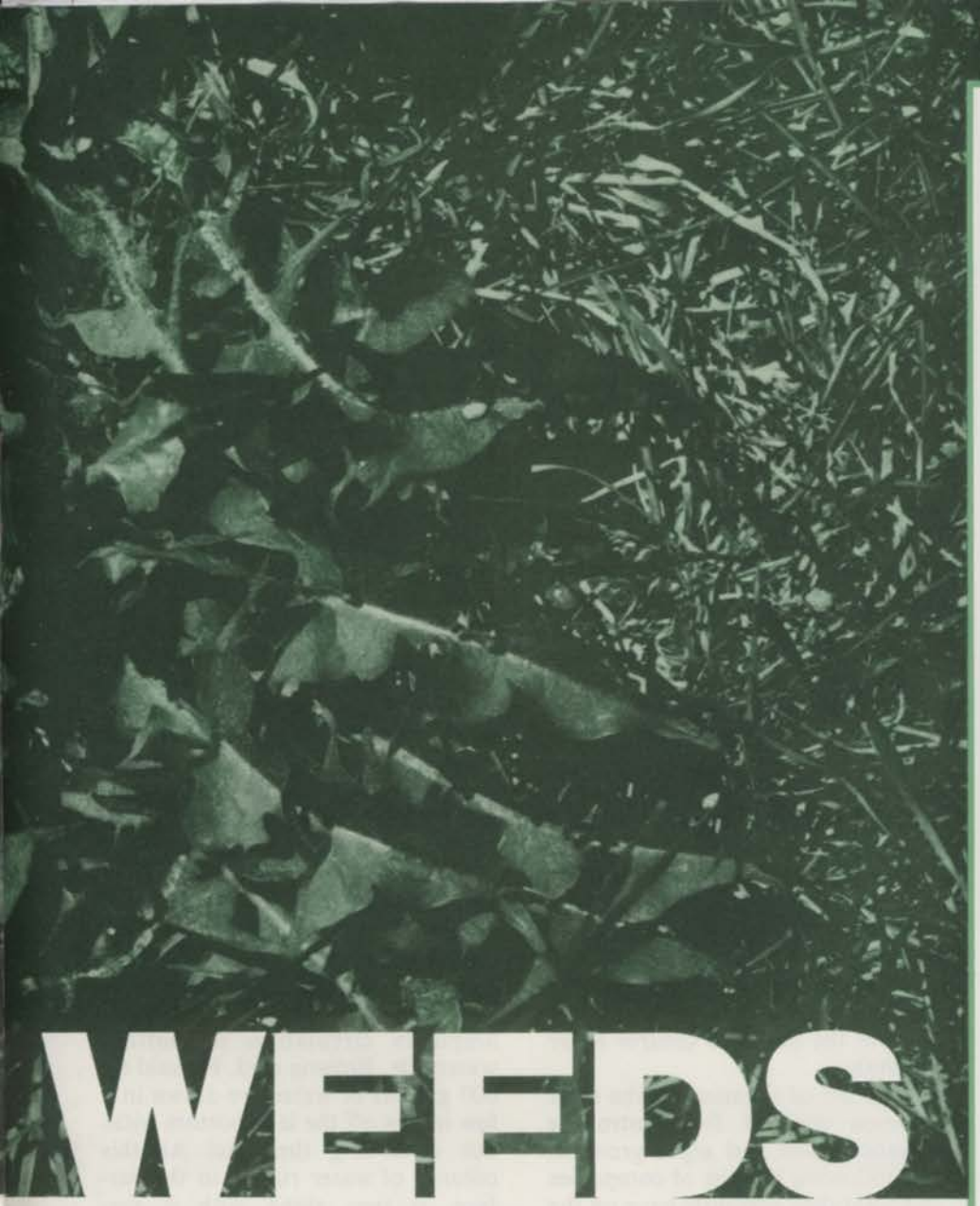
WIPE OUT WITH BANVEL® 4S...

Banvel herbicides are broadleaf weed "specialists" designed for professional turf programs.

As a professional turf man you have a reputation to be proud of. And, rightly so! Your skill, knowledge and effort shows in the beauty and quality of your turf. So why take chances with understrength herbicides? Herbicides that get some broadleaf weeds but leave you with repeated deep-rooted problems—such as dandelions and plantain. Banvel 4S and Banvel +2,4D control all the major broadleaf weeds, and most of the time with just one application. Check the chart and compare your weed problems with the herbicides available.

Here's why Banvel herbicides are the professionals' choice for weed control

- When used as directed Banvel will not harm trees, ornamentals or grass—it just eliminates weeds.
- No season restrictions. Lay down Banvel from early spring to late fall—all through the growing season.
- Rain will not affect Banvel. It keeps working because it translocates—penetrates leaves and is absorbed through roots to attack every part of the weed.
- Banvel is not a soil sterilant. There is no residual reaction from Banvel as it is broken down in the soil by bacterial action. It is biodegradable.
- No special spraying equipment necessary. It is easy to clean out of equipment after use.
- Mixes readily with hard or soft water.
- Easily stored through winter months without losing potency.



WEEDS

BANVEL®+2,4D

herbicides...

Herbicide and Broadleaf Weed Susceptibility

Weed	2,4-D	Silvex	Meco-prop	Dicamba
Bindweed	S	S-I	S-I	S
Bittercress	S	S-I	S-I	S
Black medic	R	S-I	I	S
Buttercup	S-I	I	I	S
Carpetweed	S	S	S	S
Chickweed, common	R	S	S-I	S
Mouse-ear	I-R	S	S-I	S
Chicory	S	S	S	S
Clover, crimson	S	S	S	S
Hop	I	S	S	S
White	I	S	S	S
Cranesbill	S	S-I	S-I	S
Daisy, oxeye	I	I	I	I
Dandelion	S	S	S	S
Dock	I	I-R	I-R	S
Dogfennel	I	S	I	S
Garlic, wild	S-I	R	R	S-I
Ground ivy	I-R	S-I	I	S-I
Hawkweed	S-I	R	R	S-I
Henbit	I	S	I	S
Knapweed, spotted	I	S-I	I	S
Knawel	R	S	I	S
Knotweed	R	I	I	S
Lambsquarter	S	S	S	S
Lespedeza	I-R	S	S	S
Mugwort	I	I-R	I-R	S-I
Mustards	S	S-I	I	S
Nutsedge	I	R	R	R
Onion, wild	I	R	R	S-I
Ornamental plants	S-I	S-I	S-I	S
Woodsorrel	R	S	R	I
Pennycress	S	S-I	I	S
Pepperweed	S	S-I	S-I	S
Pigweed	S	S	S	S
Plantains	S	I	I-R	I-R
Poison ivy	I	S	R	S-I
Pony foot	S	I	I	S-I
Prostrate spurge	I	I	I	S
Purslane	I	S-I	R	S
Red sorrel	R	I	R	S
Shepherdspurse	S	S	S-I	S
Speedwell	I-R	I-R	I-R	I-R
Spotted spurge	I-R	I	S-I	S-I
Thistle, musk, curl	S	I	I	S
Thistle, Canada	I	I	I	S
Vegetables	S	S	S	S
Wild carrot	S	S-I	S-I	S
Wild strawberry	R	I	R	S-I
Yarrow	I	I-R	I-R	S
Yellow rocket	S-I	I	I	S-I

S = weed susceptible; I = intermediate, good control at times with high rates, sometimes poor, usually require more than one treatment; R = resistant weeds in most instances.

Chart reprinted by permission, S. Wayne Bingham, Ph. D.

"Two" is better!

Some weeds simply aren't affected by single herbicide treatment. But Banvel +2,4D has an "additive effect" in that the two herbicides get weeds that one alone just weakens.

Banvel herbicides—products for professional turf men

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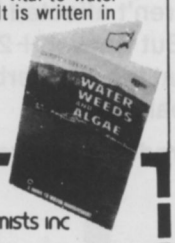

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Aquatic Weed Control

There are three forms of aquatic weed control — mechanical, biological and chemical. Various mechanical methods can be employed, including pulling, raking, digging, skimming, cutting, lining, shading, draining and dredging. Equipment costs can range from practically nothing to an investment of thousands of dollars.

Biological controls include fertilization of ponds to produce algae blooms which shade out rooted vegetation and increase fish production; the white amur, a fish that has been introduced experimentally as an aquatic weed and algae eater; a large crayfish species, *Orcanectes causeyi,* which feeds on living and dead plant material; and the lily weevil, an insect being used in some areas of the South to control water hyacinth.

The use of chemicals is the most common method for controlling nuisance weed and algae growths. The following is a list of companies and what they presently have on the market for this area of weed control.

Aquazine, manufactured by Ciba-Geigy Corp., Greensboro, N.C., is relatively new on the market. It is an algicide-herbicide used to control algae and submerged weeds in ponds. The company said it has low toxicity, and because of this there are no fishing restrictions after application. It is effective against pond plants at very low concentrations. Its low solubility helps to assure its complete dispersion throughout the pond by natural water movement, according to product manager Bob Austin.

While some chemicals kill plants immediately on contact, Aquazine is gradually absorbed, he said. When treatment is made at a five to 10 percent infestation level, the sudden deposit of dead algae and weeds is avoided, and this minimizes the danger of extreme oxygen depletion brought about as a result of massive decomposition.

The chemical will provide control of algae and weeds for a full season, depending on the degree of infestation and on climatic conditions. Where the warm season is long and water temperatures remain high, it may take more than one treatment to maintain full-season algae control. The company said Aquazine controls algae and aquatic weeds by inhibiting the photosynthetic process after being absorbed by the plants.

Kembro, Inc., Mequon, Wis., manufactures the GenAIRator, a system of pond bottom aeration designed by company president Dr. Mervin F. Browne. The unit's Venturi chamber jet plume action amplifies circulation of bottom water, Dr. Browne said. He said 6,000 gallons of water are drawn in a few inches off the lake bottom without disturbing the lake. As this column of water rushes to the surface, it tugs along with it surrounding waters, so wind action is constantly saturating enormous quantities of bottom water with oxygen.

3M Co., St. Paul, Minn., manufactures five products in this area, according to Robert E. Morrow, sales supervisor of aquatic products and services.

Mariner brand liquid copper algicide System A is an aqueous solution of a copper-triethanolamine complex. It is useful in controlling many species of plankton and filamentous algae in lakes, ponds, canals and waterways. 3M brand aquatic herbicide System E is a compacted formulation of endothall which is for controlling a variety of aquatic weeds growing in non-moving water. The product is applied to infested areas in pellet form. The pellets disintegrate into fine particles and the endothall is

released from the particles over a period of hours. Morrow said it controls coontail, elodea, hydrilla, pondweed, water buttercut, water-milfoil and widgeongrass.

Mariner brand aquatic herbicide System L contains endothall exchanged into a carrier system consisting of hydrous aluminum oxide. It controls species of hydrilla, naiad, pondweed, coontail, elodea, water-milfoil and widegeongrass.

Mariner brand aquatic herbicide System M is a wettable powder containing 55.8 percent copper in a form said to be effective in controlling chara and many species of filamentous algae in nonmoving water. It is applied as an aqueous suspension.

Mariner brand Blue Pond Dye enhances the natural beauty of pond water while concealing undesirable conditions like plankton algae, sediment and decaying vegetation. It is for use in ornamental ponds, golf course water holes and other small, water-containing areas.

Great Lakes Biochemical Co., Inc., Milwaukee, Wis. manufactures four products in this area.

Slow Release Algimycin PLL-C is a copper-based pelleted formulation for controlling attached and branched algae, especially chara and nitella. Algimycin PLL-C is a concentrated water soluble liquid aglicide of chelated copper which remain soluble over a wide pH range. It can be used with simple spray equipment or by metering directly into the fresh water supply. It can be sprayed on the water directly on floating mats of algae or injected below the surface.

Algimycin PLL is a less-concentrated formulation of chelated copper for precise dosage in small ornamental ponds.

Algimycin GLB-X is a wettable powder specifically formulated to control and prevent the growth of most algae and similar slime producing organisms found in small ornamental ponds.

Dr. Robert M. Stern of the company explained to WEEDS TREES & TURF how weed and algae control was handled recently at Meequon Municipal Golf Course in Wisconsin.

"The irrigation lake at the course posed two problems," he said. "First and most important was that the presence of large amounts of aquatic weeds and algae caused a clogging of the water intake, and secondly, the obnoxious appearance and malodors given off by decaying materials was undesirable. We also had the problem that any chemicals added must have no harmful effect on the turf."

Since the body of water had a heavy infestation of aquatic weeds and algae, it was necessary to treat for both, he said. After an identification of the types of aquatic weeds and algae growth were made, a three-step program was devised. The weeds were treated with a silvex-endothall mixture. Immediately after treatment for aquatic weeds, chelated copper in the form of Algimycin PLL-C was applied to the same area directly on the mats of the algae. Two weeks later, after most of the weeds and algae were killed and had decomposed, the same area was treated with Slow-Release Algimycin PLL-C pellets to control further growth of algae.

"Initial treatment for weeds and algae was made late in June and treatment with Slow-Release Algimycin PLL-C was made in early July," he said. "Most visible algae

please turn page

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The H-650 Harvester for aquatic weeds from Aquamarine Corp.

AQUATIC *continued*

growth and weeds had disappeared 12 days after the initial treatments. Algae was controlled successfully for the remainder of the summer around the inlet areas."

Aquamarine Corp., Waukesha, Wis., has two systems of mechanical aquatic weed harvesting, according to R. M. Stair, vice president of sales. The first is the Aqua-Trio. This consists of a harvester, transport and shore conveyor. The harvester cuts a swath of aquatic weeds eight feet wide and up to five feet deep. It can operate in water only 18 inches deep. The capacity of a hold on the unit is 650 cubic feet.

When the harvester hold is full, the transport is mechanically mated with the harvester and the load is transferred by the live bed of the harvester to the live bed hold of the transport. At the shore, the transport is mated mechanically with the shore conveyor that loads the cut weeds into a waiting truck or stack.

The company also manufactures the Sawfish, a marine front end loader. It operates on the same principle as the trio, but with smaller quantities and is a single unit. Stair told WEEDS TREES & TURF aquatic herbicides are "ecologically a disaster. We have a whole ecosystem to consider, and we don't really know that much about what happens. The decaying process of dead weeds consumes oxygen that is vital to the body of water, and you do not have this process with mechanical weed harvesting."

Phelps Dodge Refining Corp., New York, manufactures Triangle Brand Copper Sulfate. It is available in large crystals similar to those of rock salt, and also in very fine crystals like table salt. Each form has its particular uses in algae and weed control, the company said. For controlling algae, it is most practical to spray algae growths with copper sulfate that has been dissolved in water.

More copper sulfate is needed to destroy weeds than to destroy algae. For this reason, the use of copper sulfate as a weed killer may be dangerous to fish life. It is not recommended for destroying those weeds which have floating leaves or those which stick up above the water.

The most practical method for treating submerged weeds with copper sulfate is to use the large crystals.

Applied Biochemists Inc., Mequon, Wis., manufactures Cutrine-Plus and Weedtrine. Cutrine-Plus controls filamentous and planktonic algae, the company's Robert

please turn page

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Senninger said. It can be applied with regular spray equipment in its liquid form. In its granular form it controls chara, nitella and other algae that grows on the bottom. It can also control spirogyra, cladophora, vaucheria, ulothrix, microcystis and oscillatoria.

Weedtrine-D is an aquatic weed killer in recreational areas, around boat docks and long shorelines. Senninger said early in the season, when weeds have not yet reached the surface, apply Weedtrine-D by pouring directly from the container into the water throughout the infested area. In late season, he said, where weed growth has reached the surface, it may be poured from the container, injected below the water surface or sprayed on the water surface.

Thompson-Hayward Chemical Co., Kansas City, Kan., manufactures a number of aquatic management products, according to Bob DeCicco, manager of marketing services.

For submersed rooted aquatic plants, the company manufactures Casoron G-10, a herbicide also registered for the rooted algae, chara, in non-flowing waters. It is in granular form designed to sink to the bottom where the chemical is absorbed into the plant root system. It controls elodea, northern water milfoil, naiads, coontail, chara and pondweeds.

For emersed aquatic plants, endothall is the basic ingredient for three aquatic herbicides manufactured by the company. Aquathol-Plus combines contact and systemic action for the control of 25 weed species.

Ded-Weed Silvex LV is a control for submersed and emersed weeds. Best results are obtained when used before plants begin to flower. It is effective in control of alligatorweed.

Algaetrol 76 can control a broad range of algae including chara. Apply it when algae growth first becomes visible and water temperatures are above 60° F., the company said.

Air-Lec Industries, Inc., Outdoor Products Division, Madison, Wis., manufactures an aquatic weed cutter, according to Henry M. Ebbot of the sales and service department.

The unit cuts weeds in waterways and along shorelines. Ebbott said it is highly maneuverable and can work close to piers at the edge of the water. By keeping a forward speed of the recommended three to six miles an hour, quite an area can be covered in a few hours, he said.

Once cut, the weeds should be removed from the water and there is a rake attachment available for that purpose. While the rake can be mounted with the cutter, it is a much faster and more efficient operation to have the rake mounted on a separate boat, by using an auxiliary rake frame. Ebott said the cutter can keep three or four rake boats busy.

National Hydro Systems, Inc., West Chicago, Ill., manufactures the Hydro Systems Aerator, according to that company's Jim Baranyi. The unit is a floating aerator that keeps the algae level down by pumping

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water up in the air to add oxygen. It is recommended for golf courses, small lakes, public parks, industrial lagoons, farm ponds, and recreation sites.

Chevron Chemical Co., San Francisco, Calif., manufactures Ortho Diquat Water Weed Killer. Ronald G. Gras of the company said it is water-soluble and presents no hazard to fish populations when used according to label instructions. It can control bladderwort, coontail, elodea, naiad, pondweeds, water milfoil, pennywort, salvinia, water hyacinth and water lettuce, duckweed, cattails and certain filamentous algae.

Amchem Products, Inc., Ambler, Pa., manufactures a number of aquatic products, according to Robert C. de Wilde, marketing manager of industrial chemicals for the Agricultural Chemicals Division.

Aqua-Kleen contains 20 percent by weight of 2,4-D acid equivalent. Its granules sink to lake or pond bottom and release the weed killing chemical in the critical root zone of submerged aquatic weeds. The granules do not readily dissolve in water and the chemical is released slowly. Applications can be made to coincide with rapid growth of root systems. Early spring applications are more effective on most weeds than are summer or fall treatments. Susceptible weeds are water milfoil and water stargrass. Slight to moderately resistant weeds are bladderwort, white water lily, yellow water lily or spatterock, water shied, water chestnut and coontail.

Amitrol-T liquid herbicide can control cattails, phragmites and water hyacinths. Emulsamine E-3, an oil soluble amine form of 2,4-D, can control water hyacinths. Weedar 64 can control water hyacinths. Weedone, 2,4,5 TP can control alligatorweed. Fenac can control American pondweed, leafy pondweed, sago pondweed, waterthread pondweed, American elodea pondweed, southern naiad, water stargrass, coontail, milfoil sp. and slender spikerush. Weedone LV-4 can control cattails and tules.

Velsicol Chemical Corp., Chicago, manufactures Banvel-720, which has intrastate label registrations for aquatic plant control in Alabama, Florida, Georgia, Louisiana, Mississippi, Tennessee, Texas and Virginia with additional work continuing in other states. It can control water hyacinth, alligatorweed, arrowhead, cattails, frogbit, pickerel weed, slender spikerush, smartweed, water pennywort and parrotfeather.

The Agchem Division of Pennwalt, Fresno, Calif., manufactures Aquathol K, an aquatic herbicide. The company said it controls water weeds without harm to the environment or fish. It comes in liquid and granular formulations. It need be applied only once a season.

Rhodia Inc.'s Agricultural Division in Monmouth Junction, N.J. manufactures the Visko-Rhap invert emulsion system, a herbicidal control system, explained in *Operation Duckweed,* beginning on the next page. □

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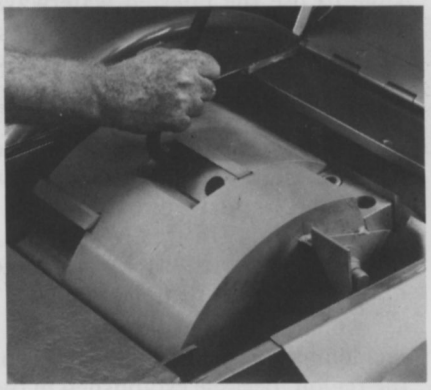

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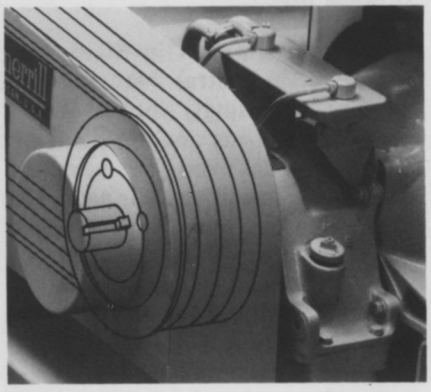

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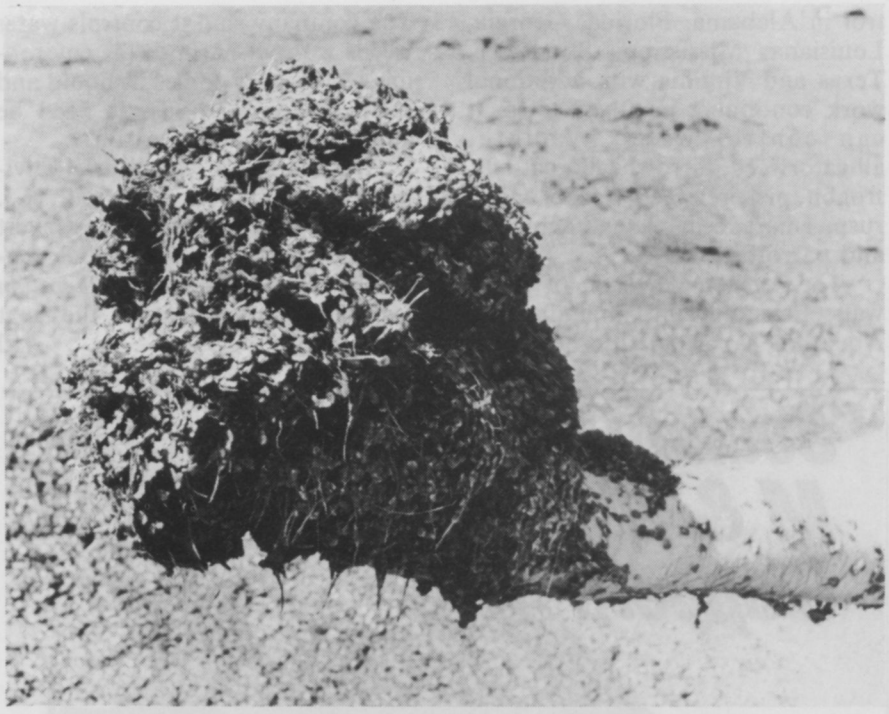

Operation Duckweed

This time last year, Alabama's Black Warrior River and boating and swimming enthusiasts among its summer cottage residents were at the mercy of duckweed — four to five feet thick in some areas. It will be different this summer.

by Charles L. Hargrove
Agricultural Division
Rhodia Inc.

For several summers the Black Warrior River in central Alabama had become increasingly choked with a pesky proliferous aquatic plant known as duckweed. But next season its waters will be clear again due to the effectiveness of an invert emulsion means of herbicidal control in "Operation Duckweed".

Until three or four years ago, the river was very popular with Birmingham-area residents for weekend and vacation fishing and boating. Many have summer cottages along the river, and fishing camps abound.

But, by the summer of 1974, the river was essentially dead. Mile after mile of its water surface was carpeted with a lush, green, "wall-to-wall" cover of duckweed, several feet deep in some places. This made it impossible to use the infested waterways for motorboating and fishing. Most of the fish camps suffered severely, and many had to close down for the season.

Although public complaints had been building over the previous few years, the explosive growth of the duckweed in 1974 finally precipitated intensive activity by state and national environmental agencies.

Apparently duckweed, which incidentally was not indigenous to the region, became established in the lagooning area, called Bayview Lake, several years ago. Until recently, however, it had not spread beyond that. But early in 1974 a spring drawdown was made and duckweed proliferated in the Black Warrior River during the summer. It reached epidemic proportions far downstream by midsummer, producing in some places a surface layer as much as four to five feet thick.

Above: Duckweed growth consists of myriad individual plants which form a choking mass, cutting off light and oxygen and endangering fish life.

Besides interfering with boating and fishing, this blanket of plant life cuts off oxygen and light to the river. Consequently, it kills the fish population and results in interruption of the natural aquatic cycle.

Government enters picture. The Alabama Water Improvement Commission (AWIC), along with the regional federal Environmental Protection Agency (EPA) office in Atlanta, had become very active in seeking a solution to this problem. Experience elsewhere suggested the solution would not be easy.

The individual duckweed plant is tiny and innocuous. An individual trefoil plant only about a quarter of an inch across, it has three hair-like roots an inch or so long. But the plant proliferates so rapidly that waterways become choked by masses of these individual plant units. Though they are separate plants and not interconnected, their population increases so fast that they create what appears to be a solid mass of plant life.

Normal types of herbicidal treatment do not function efficiently because of a tendency for the active herbicide to disperse in the water. Those solutions or conventional (oil/water) emulsions quickly become too dilute to be fully effective. Applying high enough concentrations can help counterbalance this effect, but it pushes the cost beyond economic feasibility. Also it creates unacceptably high residual levels of herbicide in the water.

After the 1974 crisis, the Awic and EPA called upon Dr. Robert D. Blackburn, a plant biologist, to find a practical solution. Formerly research leader for the U. S. Department of Agriculture's Aquatic Plant Management Laboratory (Ft. Lauderdale, Fla.), Dr. Blackburn had recently joined his wife (Candy Joyce Blackburn) in a specialized consulting firm, Joyce Environmental Consultants, Inc. (Casselberry, Fla.), to handle weed-control problems such as this.

Invert emulsion recommended. From his years of experience with similar aquatic infestations, Dr. Blackburn proposed to use a special combination of herbicides in an invert emulsion as the most productive way to

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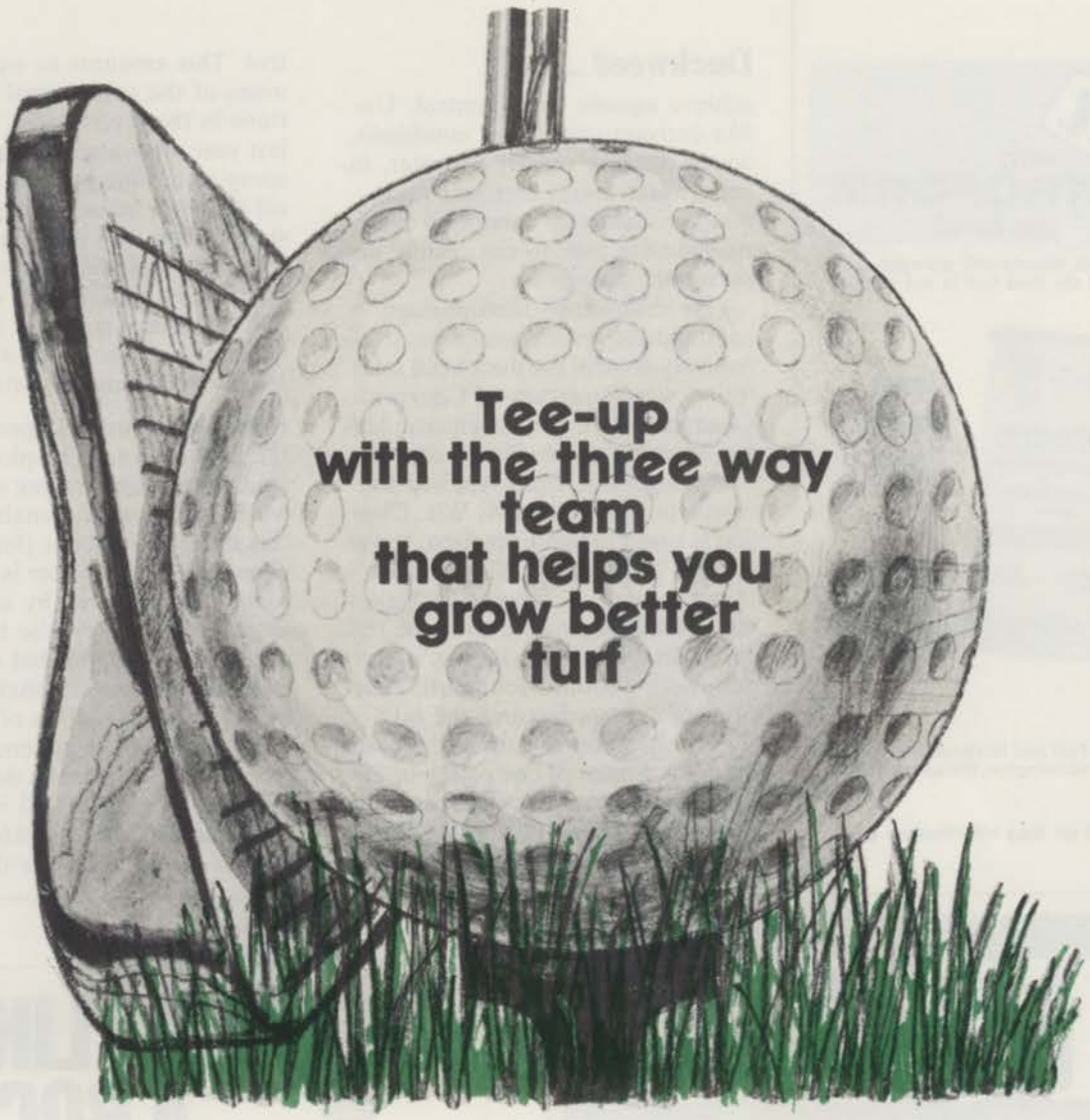

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Duckweed *continued*

achieve aquatic weed control. Unlike conventional water emulsions, which disperse readily in water, invert (water-in-oil) emulsions possess a consistency somewhat like mayonnaise and do not readily disperse and disappear.

He determined the optimum combination which would most effectively control the duckweed infestation was a mixture of Chevron Chemical Co.'s Diquat aquatic herbicide and Cutrine-Plus a copper-based algaecide from Applied Biochemists, Inc., Mequon, Wis. Chevron is based in San Francisco. It was applied through the Visko-Rhap spray system, incorporating Visko-Rhap inverting oil, to produce the invert emulsion. Rhodia Inc.'s Agricultural Division, Monmouth Junction, N.J. manufactures the oil.

Dr. Blackburn normally recommends a dosage of one gallon of Diquat (two pounds of cation) and one gallon of Cutrine-Plus (0.9 pounds copper content) for this type of control. This amounts to equal volumes of the commercial formulations in the invert spray. In May of last year, he evaluated the use of the spray technique on a closed lagoon off the river several miles downstream from the steel plant's lake. This five-acre lagoon was almost completely choked with duckweed and served as a good test area. Being outside the river itself, it could not affect conditions downstream.

How system works. Depending upon the application, he employs either a truck-mounted spraying system (for work on irrigation canals) or, as in this case, an air-boat (for jobs on open water). The latter is a flat-bottom vessel powered by an aircraft engine mounted on the transom at the stern. A two-bladed airplane propeller pushes the shallow-draft boat across the surface of the water. Consequently, the presence of duckweed or floating debris does not impede its progress. ("All it needs is damp grass," Dr. Blackburn said.)

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version of a gasoline-powered invert homogenizer (KW-MC-IOE-AAL Mechanical Invert Pump Pack) designed for aquatic spraying. Manufactured by the Minnesota Wanner Co., Inc. Minneapolis, Minn., it is capable of spraying 25 to 30 acres per day, at a rate of three or four acres per hour. Installed amidships, the unit accurately meters water, herbicides and inverting oil into the system by vacuum. The metering is done by orifice plates or discs, each with a strainer before it to prevent clogging. The water/oil ratio and the amount of herbicide to be used is all pre-calculated, to determine the proper size of orifice disc to use.

No further adjustments or measurements are required. The boat is equipped with a tank to hold the inverting oil, but the herbicides are kept in their original containers and are manifolded into the system through an orifice tube placed in each container. This eliminates the need for handling the herbicides, thereby saving time and adding a valuable safety factor to the operation.

The mixture then travels into the piston pump, which has a loop bypass, and then into the mechanical inverter. This is the main component of the system, and produces a consistent, thick water-in-oil emulsion. The invert then travels to the nozzle where it sprays out in the form of a thick strand, about the consistency of mayonnaise. This breaks up into smaller droplets as it approaches the target.

Bayview Lake, its lower half almost completely blanketed by duckweed growth, regained its pristine appearance less than a week after being sprayed with the invert herbicide emulsion.

As the mayonnaise-like emulsion impinges on the duckweed at the surface, it sticks to individual plants and does not wash off in the water. The invert transfers from plant to plant as water movement brushes them together. Any globules of emulsion that don't touch a plant initially will float on the surface, without breaking up, until they do make contact. This assures full utilization of the herbicide. Within two or three days a complete kill is observed in areas properly sprayed with the system.

The test spraying proceeded with textbook effectiveness. Results were outstanding, and Dr. Blackburn quickly got the go-ahead decision to begin "Operation Duckweed".

Killed at the source. After the success of his test run in the lagoon, Dr. Blackburn went up-river to the major source of the Black Warrior River problem — 500-acre Bayview Lake near the steel mill. While the duckweed did not extend in a solid carpet all across the surface of the lake, it was particularly dense for a considerable distance out from the shore and in large floating islands in the center of the lake.

Using a single air-boat, Dr. Blackburn sprayed over 200 acres of infested surface in 7 days. The invert-spray technique proved as effective there as its trial run had promised, and within a few days the duckweed infestation was eliminated.

He followed this by a day's spraying of a heavily infested 25-acre section of the river at Locust Fork, 12 miles downstream from Bayview Lake. As the duckweed in the river died out, the thick blanket of dead plants broke up and the re-

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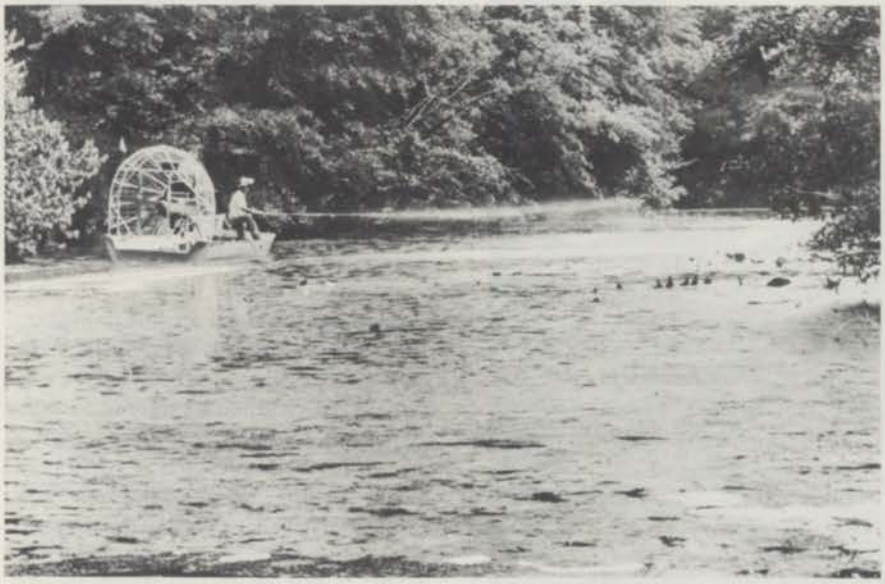

Thin stream of invert herbicide emulsion sprayed from air boat readily reaches beneath overhanging trees to reach duckweed colonies close to shoreline.

Duckweed *continued*

mains drifted downriver. The river quickly regained its usual clarity.

Vacationing fishers returned to their Black Warrior River camps in the summer of 1975. And, happily, so did the fish. As Dr. Blackburn explains, "The results of this spray project clearly demonstrated that aquatic weed control by the invert-spray technique is effective, and economical, for this type of problem. In addition, our ability to place the herbicide in direct contact with the plant — without having it disperse in the water — reduces residue levels."

Low-cost effectiveness. The cost/performance relationship becomes increasingly important these days as environmental needs interface with economic reality. With conventional spray systems, Dr. Blackburn says it would take at least a gallon of each emulsion per acre (two pounds of water-soluble Diquat cation plus 0.9 pound of complexed copper) to destroy duckweed as thick as it was on Bayview Lake and on parts of the Black Warrior River. But the invert emulsion requires, at most, only half as much active herbicide (1 pound of Diquat and 0.45 pound of copper per acre) to do the same job thoroughly. This reduces herbicide costs by 50 percent right at the start.

From his preliminary run in the small lagoon, Dr. Blackburn found that the increased effectiveness of his invert-spraying technique would permit a further significant reduction in active concentration. He used a level of 0.75 pounds of Diquat (with a proportionate reduction in Cutrine-Plus) per acre to give complete duckweed kill. This represents an overall reduction in herbicide use of more than 60 percent, compared with requirements for o/w emulsion systems employing the same active ingredient for the same application.

To control amount of herbicide used, Dr. Blackburn changes orifice discs. The two herbicides he used in this job, Diquat and Cutrine-Plus, were metered directly from their shipping containers through the orifice tubes into the system. This avoided the dangers of pouring and mixing these herbicidal solutions. (Dr. Blackburn feels the safety factor can't be emphasized strongly enough. He finds that most accidents associated with aquatic herbicides occur during the mixing procedure.)

Where necessary, he can feed one or two more solutions into the pump simultaneously, making it possible to homogenize as many as six input streams (up to four active solutions, plus invert oil and water) to form a stable invert emulsion.

Other applications. Besides similar duckweed projects elsewhere in the South, Dr. Blackburn employs a variety of emulsion systems to control such aquatic plants as water hyacinth, water lettuce, hydrilla, naiad, cattail, brush, and ditch-bank grasses. In most irrigation-canal situations, he uses a truck-mounted invert pump. With this setup, he can spray over 50 acres per day. □

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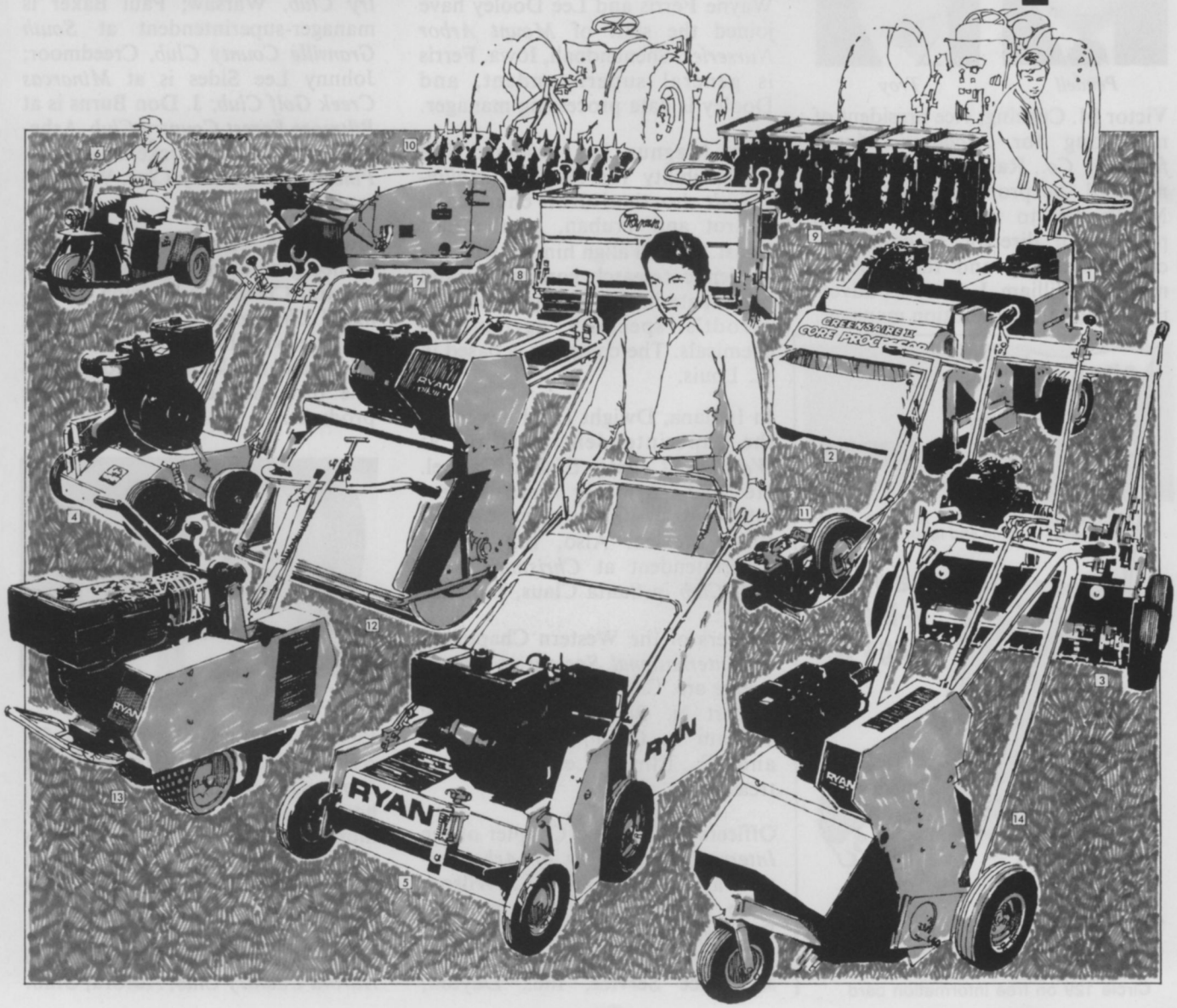

People on the Move

Job changes in the *Tennessee Golf Course Superintendents Association* include: Jim Harris is at Richland County Club, Nashville; Howard Gardner is at Stones River Country Club, Murfreesboro; Joe Briguglio has moved from Brainerd Golf Club in Chattanooga to Lakewood Country Club in Tullahoma as pro-superintendent; Ray Blankenship is at Carnton Golf Club; and Chuck Chandler is at Cobbly Nob.

Pendell

Troy

Victor M. Cushing, vice president of marketing for *Jacobsen Manufacturing Co.*, Racine, Wis., has announced the promotion of Jerome M. Pendell to the newly created position of director of communication planning and the appointment of William J. Troy as advertising and sales promotion manager.

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Max Yost is the new superintendent at *Unity Village Golf Course* in Kansas. He is from Hutchison, Kansas, and is a graduate of Kansas State University.

Eddie Mena, formerly superintendent at *Princess Acapulco Country Club*, Acapulco, Mexico, is now back at his former club, *Rancho Bernardo Country Club*. Also in California, Barry Neals replaces Gene Stoddard as superintendent at *Irvine Country Club*. Chuck Whitacre is superintendent at *Cherry Hills Country Club*, Sun City. Dave Zahrte is superintendent at *Candlewick Country Club, Whittier.*

Wayne Ferris and Lee Dooley have joined the staff of *Mount Arbor Nurseries*, Shenandoah, Iowa. Ferris is general superintendent, and Dooley is data processing manager.

Jack Magnus has assumed full responsibility for retailing *Mallinckrodt* horticultural chemicals, Banrot and Truban, to the East Coast. He will align himself with the academic research community and participate in the testing of Mallinckrodt's specialty agricultural chemicals. The company is based in St. Louis.

In Indiana, Dwight Ladd has taken the superintendent position at *Woodland Country Club* in Carmel. He had formerly been superintendent at *Guadalajara Country Club*, Mexico. Also, Bill List is superintendent at *Christmas Lake Golf Club* in Santa Claus, Indiana.

Officers of the Western Chapter of the *International Society of Arboriculture* are: Clark O. Eads, president; Robert N. Berlin, president-elect; William L. Owen, vice president; and C. Elmer Lee, secretary-treasurer.

Officers of the Ohio Chapter of the *International Society of Arboriculture* are: Dr. Charles L. Wilson, Ohio Agricultural Research and Development Center, Wooster, president; Blair E. Caplinger, Nelson Tree Service, Inc., Dayton, president-elect; Ralph M. Veverka, Division of Shade Trees, Cleveland, vice president; Dr. Davis T. Sydnor, Department of Horticulture, Ohio State University, executive secretary; and Dr. Bruce Roberts, Shade Tree and Ornamental Plant Lab, Delaware, editor.

In California, Charles Amos has left *California Country Club* to become superintendent at *Hacienda Country Club*, La Habra; Don Clark, superintendent at *Meadows Country Club*, Escondido, Calif., is now at *Escondido Country Club.*

A number of superintendent job changes have taken place in North Carolina: Lowell Pennell is at *Asheville Municipal Golf Course;* C. B. Kelly is at *Sea Scape*, Kitty Hawk, N.C.; Lew Dexter is at *Duplin Country Club*, Warsaw; Paul Baker is manager-superintendent at *South Granville County Club*, Creedmoor; Johnny Lee Sides is at *Minorcas Creek Golf Club;* J. Don Burns is at *Biltmore Forest Country Club*, Asheville; and Boots Berckemeyer is at *Pine Valley Country Club*, Wilmington.

George A. Lawrence has been named general manager of the Agricultural Chemicals Division of *Diamond Shamrock Corp.*, Cleveland. He is responsible for research, operations and marketing the company's line of agricultural and turf care products.

Lawrence

Thurmond

Eastern regional sales manager for *Rain Bird Sprinkler Manufacturing Corp.*, Glendora, Calif., Ken Mills, has announced that Robert Thurmond has joined the company as southwest district manager. He will be working with both agricultural and turf accounts.

Tom Matthews is superintendent at *Aurora Country Club*, Aurora, Ohio.

R. Earl Dowell, superintendent at *Lafayette Country Club* in Indiana has retired after 29 years at the club. He started at the club in 1947 when it was a nine-hole facility. It now has 27 holes. His course has been involved with much experimental work, including Dr. William Daniel's Purdue work with calcine clay, tricalcium arsenate and zoysiagrass. He also trained many young men including GCSAA director Charles Tadge, Dave Fearis, Dave Wahn, Ron Graves, Steve Gibson, Bob Brame and Lee Overpeck among others.

Officers of the *Texas Society of Landscape Architects* are: John F. Teas, president; Steven D. Dodd, Jr., vice president; and Charles F. Heinselman, secretary-treasurer. Directors are: Mancill Allen, John P. Classen, Jr., Albert T. David, Robert W. Caldwell, James A. Foy, Jr., Gratz C. Myers, Jr., and F. O. Smith, Jr.

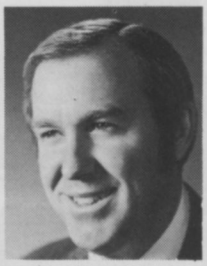
Dr. A. J. Powell has been appointed to the faculty of the *University of Kentucky's* Department of Agronomy as the extension specialist in turf. His responsibilities in applied research and extension cover all areas of turf management.

Henry C. Wetzel is superintendent at *St. David's Golf Club* near Philadelphia. He is the son of longtime superintendent Heinie Wetzel and is a graduate of Delaware Valley College of Science and Agriculture. He was most recently superintendent at *Holly Hills Golf Club,* Alloway, N.J.

Sprinkler Irrigation Association, Silver Spring, Md., has announced an appointment and an award winner. Thomas J. Schiltz has been named director of education and technical services. Walter W. Hinz, extension agricultural engineer at the University of Arizona, was named recipient of the association's "Man of the Year" award.

Gary J. Aagesen has been named technical service representative for the state of Wisconsin by *Chemagro Agricultural Division,* Kansas City, Mo.

James R. Smith has been promoted to director, market development, agricultural marketing services and planning for *Elanco Products Co.,* Indianapolis. M. Phillip Davis has been transferred and promoted from agricultural sales trainee in Clemson, S.C. to sales representative working out of Raleigh, N.C.



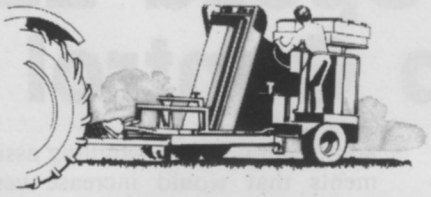
Smith

Evans

Thomas E. Evans has been appointed director of marketing, Agricultural Business Group, *Velsicol Chemical Corp.,* Chicago. He was formerly national sales manager of the Professional Pest Control Department at Velsicol. He began his career with Velsicol in 1960 as Consumer Products sales representative in Ohio, Kentucky, Michigan and Indiana and was later promoted to market manager in that same department.

At the conclusion of a recent banquet, Gerald D. Schade, Shade & Sun Nursery, Stormville, N.Y. was inducted into the *New York State Nurserymen's Association* Hall of Fame. The presentation was made by Mal Downie of Rosedale Nurseries, Inc., Hawthorne, N.Y.

The "Tow-Boy"
SOD HARVESTER



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Forklifts Speed Landscaping, Help Control Costs

Machines that became an operational necessity with the advent of palletized sod have since proved a key element in the growth of a Chicago-area landscape contractor. By deploying a spread of rough-terrain forklifts to handle sod and a variety of nursery stock on its projects, the contractor has speeded work and controlled costs on its landscape contracts.

Forklifts became a required tool for Lawrence & Ahlman, Inc., Dundee, Ill., when Chicago-area sod growers began handling sod rolls on pallets to help overcome labor shortages and spiralling costs. Prior method was all by hand, proving both time consuming and costly for sod farmer and landscaper.

Since pallets, the contractor dispatches its four forklifts to sodding projects to unload and strategically place sod pallets for its crews to go to work.

But while the machines performed their primary function of pallet handling, the contractor saw additional material handling assignments that would increase versatility on the job and free other equipment for additional tasks. In addition to unloading and spotting sod pallets, the forklifts are also used at Lawrence & Ahlman's yard and nursery for handling balled and burlapped nursery stock.

Lawrence & Ahlman tackles a job from design to finished product. Most of their work requires grade preparation for sodding or seeding and final landscaping. Once grading is finished and soil has been prepared, the contractor carefully plans remaining work to control costs and assure timely completion.

"The essence of a landscaping project, no matter what kind of job it is," says Ron Ahlman, co-founder and vice president, "is speed. Sod, more than any other product, is a highly perishable commodity, and if left rolled or unwatered, will soon smother and could die in just a couple of hot days. The idea is to get sod laid and new trees planted as quickly as possible."

To do that, sod transported to projects from the sod farm on a tractor-trailer is quickly off-loaded by one of the forklifts on the job. On each 40-foot-long flatbed trailer, 14 pallets containing as much as 1,000 yards of fresh sod must be removed quickly to free the transport for other hauls. Each pallet can weight up to 2,800 pounds.

The forklift will remove and carry the first pallets to workmen for laying, then return to finish off-loading the trailer. The unit takes less than 20 minutes to completely remove pallets and station them nearby. Once the trailer is off-loaded, the forklifts are used to lift and carry pallets to the landscaping crews.

The contractor assigns an average crew of six men for each 1,000 yards of sod that has to be placed and estimates each crew can place up to 2,000 yards in a normal eight hour shift. Trees and shrubs are planted by at least two men, depending on the size and weight of the plant.

All sodding projects require at least one forklift to handle pallets and assist crews. Lawrence &

please turn page

Above: As the forklift backs slowly down the roadside, two installers drop and evenly space rolls of fresh sod.

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University tests using leading fungicides prove it. Add Exhalt 800 Sticker-Extender: minimum label formulation gives control equal to higher recommendations without Exhalt 800.

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Forklifts *from page 36*

Ahlman recently completed an environmental project along a 2½ mile stretch of Route 68 near Arlington Heights, Ill. The job called for installation of 40,000 square yards of sod in the median strip and along the right-of-way of the recently improved highway.

To handle the project, Lawrence & Ahlman sent a 10-man crew equipped with utility truck, an International tractor loader and one of its forklifts. On a typical day the crew moved into action with the forklift maneuvering in and out of traffic, carrying pallets of sod to the installers.

Two or more workmen removed sod rolls from the pallet, dropped and spaced them evenly as the forklift backed slowly down the roadside. The rest of the crew followed along unrolling and fitting the strips of sod. Once the pallet was empty, the forklift then tracked 200 yards back to a nearby parking lot to pick up another pallet of fresh sod.

The tractor loader on the job site preceeded sodding operations by clearing and grading sections that had to be landscaped. Later in the day, once large enough sections were sodded, Lawrence & Ahlman's tanker made several sweeps past spraying the freshly greened areas with water.

A few miles south of the highway project a second Lawrence & Ahlman crew was completing sod installation of an open space in the center of a new apartment development. The second project called for 7,000 square yards of sod and required an eight-man crew along with another of the contractor's forklifts.

The rough terrain forklifts in Lawrence & Ahlman's equipment spread have proved to be an integral factor to the contractor's successful operations. The machines are an effective time and money-saver and their use on many projects frees wheel loaders for other assignments.

"Forklifts are ideally suited to landscaping operations," attests Ahlman. "Each of these units easily handles sod pallets weighing up to 1½ tons, and can negotiate a site to place loads where we need them, saving considerable time and expense.

"Many times, we're at a site that has obstructions like curbs or timber. Using pallets and the forks to lift-and-carry eliminates the need for a crew to help fill a wheel loader's bucket. And these rough-terrain forklifts climb a curb with no trouble at all. Because of their versatility, we can schedule equipment for other uses and eliminate idle machine time."

The units are equipped with manual shuttle transmissions and can safely lift up to 4,000 lb. Each machine is equipped with a 42 hp Perkins gas engine and two-stage 10 foot mast. The units Lawrence & Ahlman use are manufactured by Massey-Ferguson, Inc., Des Moines, Iowa.

Lawrence & Ahlman began operations 17 years ago, specializing in residential landscaping. Since then, the contractor has grown to an annual contract volume exceeding $1 million. During peak months the company employs more than 100 people and operates primarily within a 75-mile radius of metropolitan Chicago.

The contractor's projects vary from municipal contracts, highway sodding and planting, to golf courses, industrial parks, shopping malls, and university campuses. Sod, tree and shrub planting comprise the bulk of Lawrence & Ahlman's material handling requirements and call for mobile equipment to handle and place the stock on the job. □

Forklift picks up a fresh pallet of sod to carry 200 yards up the road to installers.

Proxol® 80 SP Insecticide
Stops These Turf-Marauders Before They Start.

Sod Webworm Cutworm Armyworm White Grub

Each sod webworm larva chews up 20 square inches of turf during its average life-span of 20 to 40 days. The cutworm larva can devour up to 36 square inches. Multiply this by the average 300 to 500 larvae generated from each adult in a 1½ to 3 week period and you begin to realize the damage these turf pests can cause.

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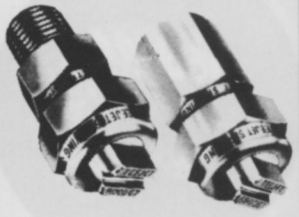

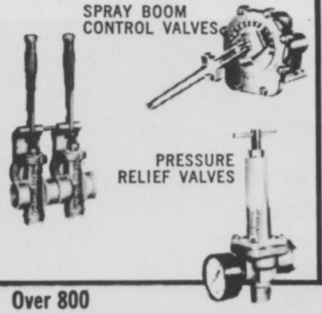

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Meeting Dates

Northern Michigan Turf Managers Association Meeting, Birchwood Farms, Harbor Springs, June 15.

Heart of America Golf Course Superintendents Association Meeting, Shawnee Country Club, June 15.

National Arborist Association First Management Seminar, O'Hare Hilton, Chicago, June 15-16.

Arizona Landscape Contractors Association Annual Meeting, Mountain Shadows, Scottsdale, June 16-20.

Metropolitan Golf Course Superintendents Association Meeting, Pelham Country Club, June 17.

Northern Ohio Golf Course Superintendents Association Meeting, Madison Country Club, June 17.

Missouri Association of Nurserymen Annual Convention, Stouffer's Riverfront Towers, St. Louis, June 20-22.

Rutgers Turfgrass Research Field Day, Adelphia Research Center, Adelphia, N.J., June 23.

Golf Course Builders Association Meeting, Fresno and Del Monte Lodge, Monterey, Calif., June 24-27.

Illinois State Nurserymen's Association Summer Conference and Annual Membership Meeting, Marriott Lincolnshire Resort, Lincolnshire, Ill., June 28-29.

Hi-Lo Desert Golf Course Superintendents Association Meeting, Del Safari Country Club, June 30.

Tri-State Golf Course Superintendents Association Meeting, Lakewood Country Club, Rockport, Ind., July 6.

Connecticut Nurserymen's Association Annual Summer Meeting, Holdridge Farm Nursery, Inc., Ledyard Center, Conn., July 6.

Wholesale Nursery Growers of America Summer Membership Meeting, Sheraton-Boston, Mass., July 10.

American Association of Nurserymen Annual Convention, Sheraton-Boston, Mass., July 10-14.

76th Annual Meeting of the American Society of Landscape Architects, Hotel de Coronado, San Diego, Calif., July 11-14.

Aquatic Plant Management Society Annual Meeting, Pier 66, Fort Lauderdale, Fla., July 11-14.

Golf Course Superintendents Association of New England, Joint Meeting with Rhode Island Golf Course Superintendents Association, Agawam Hunt, July 12.

Indiana Golf Course Superintendents Association Meeting, Tippecanoe Lake Country Club, July 13.

American Institute of Landscape Architects Regional Meeting, Santa Fe, N.M., July 15-17.

Rocky Mountain Golf Course Superintendents Association Meeting, Los Verdes Golf Course, July 15.

Midwest Association of Golf Course Superintendents Meeting, Exmoor Country Club, July 19.

Northern Michigan Turf Managers Association Meeting, joint with Michigan Border Cities Golf Course Superintendents Association and Western Michigan Golf Course Superintendents Association, Michigan State University, East Lansing, July 20.

Northern Ohio Golf Course Superintendents Meeting, Prestwick Golf and Country Club, July 20.

Greater Cincinnati Golf Course Superintendents Association Meeting, Fort Mitchell Country Club, July 20.

American Sod Producers Association Summer Convention and Field Days, Treadway Inn, Newport Harbor, R.I., July 21-23.

American Association of Nurserymen 21st Management Seminar, Colorado State University, Fort Collins, July 25-30.

Penn Allied Nursery Trade Show, Hershey Motor Lodge Convention Center, Hershey, Pa., July 27-29.

University of Massachusetts Third Annual Turf Field Day, South Deerfield Turf Station, South Deerfield, July 28.

Southern Nurserymen's Association Horticultural Trade Show, Marriott Motor Hotel, Atlanta, Ga., August 1-3.

Tennessee Golf Course Superintendents Association Meeting, Crockett Springs National Golf Course, Brentwood, August 2.

Tri-State Golf Course Superintendents Association Meeting, Evansville Country Club, Ind., August 3.

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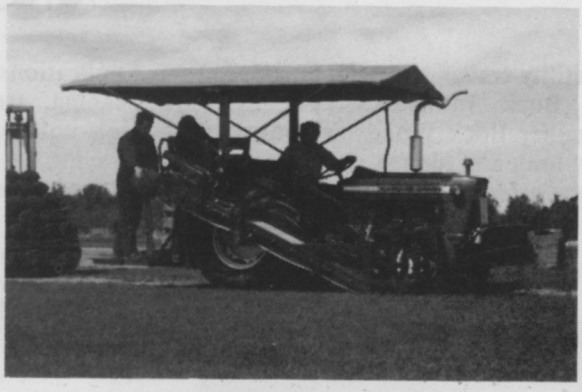

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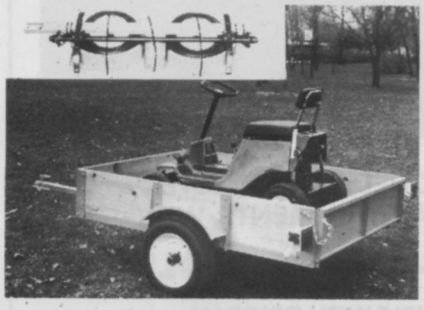
Circle 120 on free information card

Products

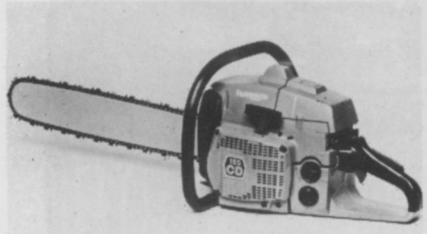
A utility trailer has been introduced by Bock Industries. The bolt-together Bock Woody is almost 10 feet long and almost six feet overall when assembled. It has a 52 x 72 x 11 bed and a 1,000-pound load



capacity. Its tilting bed and hinged tailgate — which doubles as a loading ramp — makes it easy to manipulate which doubles as a loading ramp — makes it easy to manipulate cargo that could not be handled any other way.

Circle 701 on free information card

A new compact 85cc saw has been added to the Husqvarna line. The model 185CD is compact and easy-to-handle, but with enough power to compete with big saws. It weighs 17 pounds. Its power-to-weight ratio is



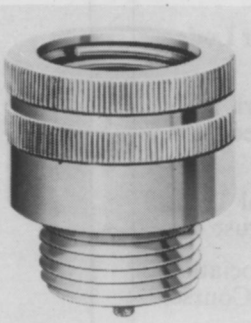
an important feature, the manufacturer said. It is equipped with a silencer with a spark arrester plus an exhaust deflector and a double plate on the silencer that reduces surface temperature.

Circle 702 on free information card

All-purpose sprayer is the subject of a free data sheet published by Broyhill Co. There is a choice of roller, centrifugal or piston pump system options; three tank capacities; plus a full line of accessories including handguns, reels, booms and trailer wheels which adapt the basic sprayer to a wide variety of uses. Applications include high-pressure cleaning, trees and orchards and high-volume turf and grounds spraying.

Circle 703 on free information card

Rain Bird has developed a new hose connection vacuum breaker for use with portable hoses. It has a wide variety of indoor and outdoor applications, including swimming



pools, commercial and institutional hose connections, and general outside gardening hose bibs. Designated series HVB, the new vacuum breaker has a non-removable feature to prevent unauthorized removal from sill cock.

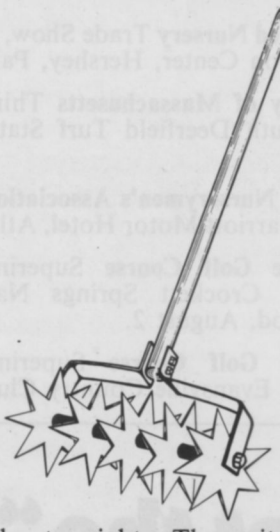
Circle 704 on free information card

A maneuverable new riding mower with an out-front cutter deck that mows a 72-inch swath has been introduced by the Turf Division of Jacobsen Manufacturing Co. Featuring rear-wheel steering, the new mower can turn in its own radius for optimum trimming tight-

up around trees and plantings, as well as cutting under shrubs and overhanging branches. Its two-wheeled cutter deck carrier is articulated for mowing gullies, slopes and knolls. Four caster wheels and three rollers on the deck prevent scalping. During transport, the unit can climb curbs with no damage to deck components.

Circle 705 on free information card

A hand aerator has been introduced by Turf Maker, Inc. Called the Handi-Spiker, it features five spiking discs that penetrate to a dept of 1¾ inches on a seven-inch swath



without weights. The unit will not lift turf and the company said it is faster and more efficient than a rake in cultivating and loosening smaller compacted areas where large equipment is not suitable.

Circle 706 on free information card

A trencher that is a new improved version of the MK18 Digz-All, Inc. service line trencher has been introduced. Trenching depth capability ranges include from three to six feet, and width ranges from four to 12 inches. Digging speed is variable to 30 feet a minute.

Circle 707 on free information card

A spray boom that covers 84 feet has been introduced by FMC Corp.'s Agricultural Machinery Division after extensive field testing last year. Designed for mounting on 1,000-gallon, high-pressure sprayers, the hydraulic boom features four folding sections which may be folded or elevated by remote control from the tractor cab. A fifth center section sprays directly behind the sprayer.

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There's no need for pressure regulators or other high maintenance parts. The Turf-Truckster transmission teamed with the variable-speed governor assures uniform ground speed over varying terrain. And the accuracy of the metered spray can reduce chemical waste.

The end result is an all-purpose spraying rig that can handle just about any spraying job you have . . . and handle it for years to come. Because, like every Cushman product, it's built for longevity as well as performance.

With other accessories, your Cushman can spike, dump, aerate, and top dress. Use it. It's a lot more than basic transportation. It's a total turf-care system. Write for your Cushman Turf catalog today.

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Circle 102 on free information card

NEWS *from page 9*

Seay Is Elected President Of Golf Course Architects

Edwin B. Seay of Ponte Vedra Beach, Fla., was elected president of the American Society of Golf Course Architects at the group's 30th annual meeting at Del Monte Lodge in Pebble Beach, Calif., recently. He succeeds Geoffrey S. Cornish of Amherst, Mass.

Seay, who has been involved in the design of over 50 golf courses, is now working on projects in 15 states, Japan, the British West Indies, Central America and Europe.

Other officers elected at the meeting include William W. Amick of Daytona Beach, Florida, Vice President; Rees L. Jones of Montclair, N.J., Secretary; and Jack Kidwell, of Columbus, Ohio, Treasurer.

In addition to the officers and past presidents, other elected to the Board of Governors include: Arthur Jack Snyder of Phoenix, Gerald Matthews of Laingsburg, Michigan, Mal Purdy of Livingston, N.J., Richard Phelps of Lakewood, Colorado, Dave Gill of St. Charles, Illinois, Richard Nugent of Palatine, Illinois and Phil Wogan of Beverly, Massachusetts.

Mark Mahannah of Miami and William H. Neff of Salt Lake City were elected Fellows of the Society, which includes leading golf course architects from Canada, Mexico and the United States. Both Mahannah and Neff have been members of the Society for more than 10 years and have reached the age of 70.

Frank "Sandy" Tatum, Vice President of the United States Golf Association, told the architects that "your statements about the game are the ones that count most and the ones that last. You inscribe your views, thoughts and feelings about the game in the ground and those inscriptions will be there as long as the courses are there to tell the golfer what he has to accomplish to satisfy your view of the game.

"The courses you design, therefore, are relatively permanent inscriptions on and in the face of the earth that say what you think and feel golf is all about and also whether and to what extend you understand, appreciate and indeed love it."

Pesticide Book Helpful For Taking State Tests

A new book especially helpful to anyone preparing for federal and state tests leading to certification or licensing as a pesticide applicator has been published by W. H. Freeman and Co., 660 Market St., San Francisco, Calif. 94104.

Pesticides: An Auto-Tutorial Approach was written by George W. Ware, professor and head of the entomology department at University of Arizona, Tucson.

With this volume, one can learn the fundamentals of pesticide chemistry; what the various pesticides are, how they work, and how they can be handled safely; and an appreciation for the value of twentieth century "super chemicals," the publisher said. The material has been selected for either self-study or classroom use.

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NEWS *continued*

Michigan Nurserymen Meeting Set for Saginaw

The 55th annual Michigan Association of Nurserymen convention will be at Saginaw Civic Auditorium February 15-17. Convention chairman is John Burdick, Burdick's Seed House, Saginaw.

Over 80 spaces have already been requested by exhibitors. The Michigan Association of Landscape Architects, Michigan Christmas Tree Association and Sod Growers of Michigan have been invited to hold their annual meetings in conjunction with the convention.

Workshops and sessions of general interest will be prepared utilizing personnel from Michigan State University Department of Horticulture and other members of the industry.

Illinois Superintendent Gives Thoughts on Show

Michael R. Bavier, superintendent at Inverness Golf Club, Palatine, Ill., took time in a recent issue of the newsletter of the Midwest Association of Golf Course Superintendents to voice his thoughts on the recent Golf Course Superintendents Association of America turfgrass conference in Minneapolis, among other things. Some of his thoughts are shared here.

"Our certification program is adequate," he said, "but would carry much more meaning if the pesticide seminar was handled in conjunction with it, which in turn might be valid for state pesticide licensing."

He also said the conferences concurrent sessions divide everyone up so that only a limited number of people attend each session.

"With so many speakers, one becomes frustrated trying to decide which one to attend," he said. "The cost of bringing out-of-town speakers to the conference is quite enormous, as you can well imagine. Are we missing the point of having some of our best people give talks and also of leaving a little time for the equipment show and for turf talk with fellow superintendents?"

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Are Turfgrass Clippings Potential Animal Food?

There may be an important potential market in the future for turfgrass clippings as animal food sources, according to Dr. Al Turgeon of the University of Illinois.

Speaking at a meeting of the American Sod Producers Association earlier this year, Dr. Turgeon stressed present economics do not make this a realistic possibility, but that situations change, and it may be a thing of the future. He said Warren's Turf Nursery, Palos Park, Ill., pelletizes its clippings, and there are other possibilities like this.

He said lutein content is necessary for the poultry market, and crude protein content is necessary in the clippings for cattle-feeding. Mowing height and fertilization have effects on the protein content — with a lower cutting height, there is more protein available; and timing of nitrogen fertilization also affects the content. The type of nitrogen carrier also has an effect on the protein yield.

He also said there are presently studies going on using turf clippings as sheep feed.

please turn page

Glade

KENTUCKY BLUEGRASS

U.S. Plant Patent 3151

Another fine, quality-controlled product of Jacklin Seed Company.

Glade is a healthy little bluegrass with a higher level of resistance to powdery mildew and a better ability to grow under trees in up to 60% shade. Grows beautifully in open sun, too! Glade Kentucky bluegrass is your guarantee of physically pure and genetically true seed. You won't be plagued with annual bluegrass *(Poa annua)*, bentgrass or short-awned foxtail when you plant Glade.

A selection from Rutgers University, Glade has improved resistance to stripe smut, leaf rust, and good resistance to leafspot. Nationally tested as P-29, Glade is one of the fastest germinating bluegrasses. It establishes quickly forming a dense sod and thick, low-growing, leafy turf of a beautiful, medium to dark green. Glade mixes well with fine fescues for higher acid soils and blends well with other elite bluegrasses, persisting in moderate shade when others weaken.

Specify Glade Kentucky bluegrass for use in full sun or in mixtures with fine fescues for shade. You'll find Glade at your local wholesale seed distributor.

Good supplies of new crop Glade seed available early August.

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Lower Use Rates Announced For Elanco Herbicide Spike

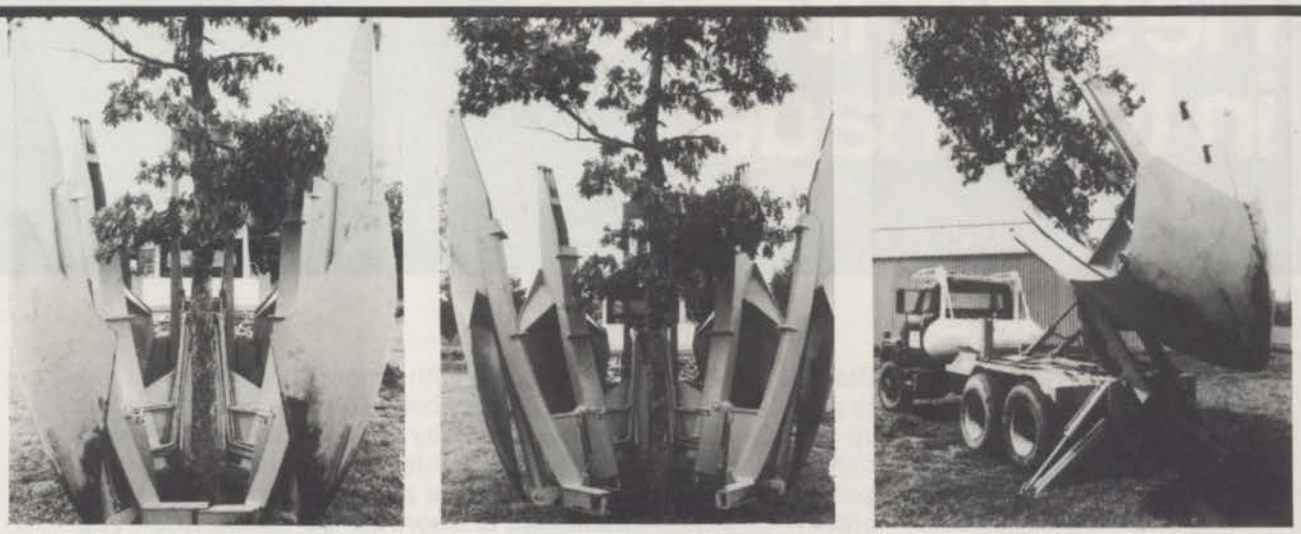
The Environmental Protection Agency has accpeted reduced use rates of Spike, a herbicide for total vegetation control in non-cropland areas. It is manufactured by Elanco Products Co., Indianapolis, Ind.

The company recommends using the following reduced rates. In non-cropland areas east of the Rocky Mountains treated the previous season with Spike or other residual herbicides, two pounds per acre, applied prior to or just after plant emergence, will control the following: annual bluegrass, Kentucky bluegrass, bouncingbet, wild carrot, common chickweed, crabgrass, croton, annual fleabane, foxtail, horseweed, milkweed, mullein, fall panicum, wild parsnip, pepperweed, pigweed, common ragweed, smartweed, sweetclover, Canadian thistle, and yellow woodsorrel. In addition to these weeds, it will control goldenrod and spurge at three pounds per acre.

In non-cropland areas west of the Rocky Mountains treated the previous season with a residual herbicide, 1.5 pounds of it per acre will stop fivehook bassia, cheat, cudweek, foxtail, prickly lettuce, milkweed, wild oat, bristly oxtongue, pigweed, plantain, annual ryegrass, saltbush, shepherdspurse, and witchgrass. In addition to these weeds, it will control the following when applied at two pounds per acre: buttercup, reed canarygrass, Russian knapweed, knotweed, mallow, mustard, western ragweed, yellow starthistle, telegraphweed, and Russian thistle. At three pounds per acre, Spike also kills barley, gumweed, puncturevine, alkali sida, and swamp smartweed.

Warren's A-34 at Kennedy

Robert Kennedy Memorial Stadium in Washington, D.C. was sodded in the spring of 1975 with Warren's A-34 Kentucky bluegrass, furnished by Princeton Turf Farms, Centreville, Md. A news story in the April issue did not have this information.



It opens wide for wide-spread trees and shurbs — the Big John Tree Transplanter. It's able to move up to 10" trunk trees with a 7,000-lb. root ball (tandem truck recommended).

Big John, with curved tracks, has an overall width open of only 12'8", allowing the machine to work between close trees. Its automatic latch and curved tracks allow no hinging of tracks and the complete operation is handled from the control panel.

Big John's simple and strong design makes for a long lasting and maintenance-free machine. Large stabilizers hold machine for loading on soft ground.

FEATURES: Spoon-shaped blades, 360° leveling, simple construction, most parts standard.

SPECIFICATIONS: Height closed for transporting: 13'-13'5", width closed for transporting: 7'11", root ball width: 78", root ball depth: 54", blade travel: 63".

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Big John Tree Transplanter

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When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

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USED EQUIPMENT

FOR SALE: 2 used aerial baskets — 50 ft. working height, 2 Asplundh brush chippers. Bean sprayer, 35 G.P.M. Vermeer stump cutter 1560. Parkway Tree Service, Milwaukee, Wisconsin. Phone 414 257-1555.

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TURF FARM MANAGER, 5 years experience, must be willing to work and manage 50 to 75 men. Send resume to Richlawn Turf Farm, 15290 Arapahoe Road, Denver, Colorado 80232.

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Next Month

The July issue of WEEDS TREES & TURF will feature a symposium on *Fusarium* blight headed up by Dr. Al Turgeon of the University of Illinois, a special emphasis on tree and ornamental care and coverage of the recent testimonial dinner for "Mr. Sod" in Maryland, Parker Shirling.

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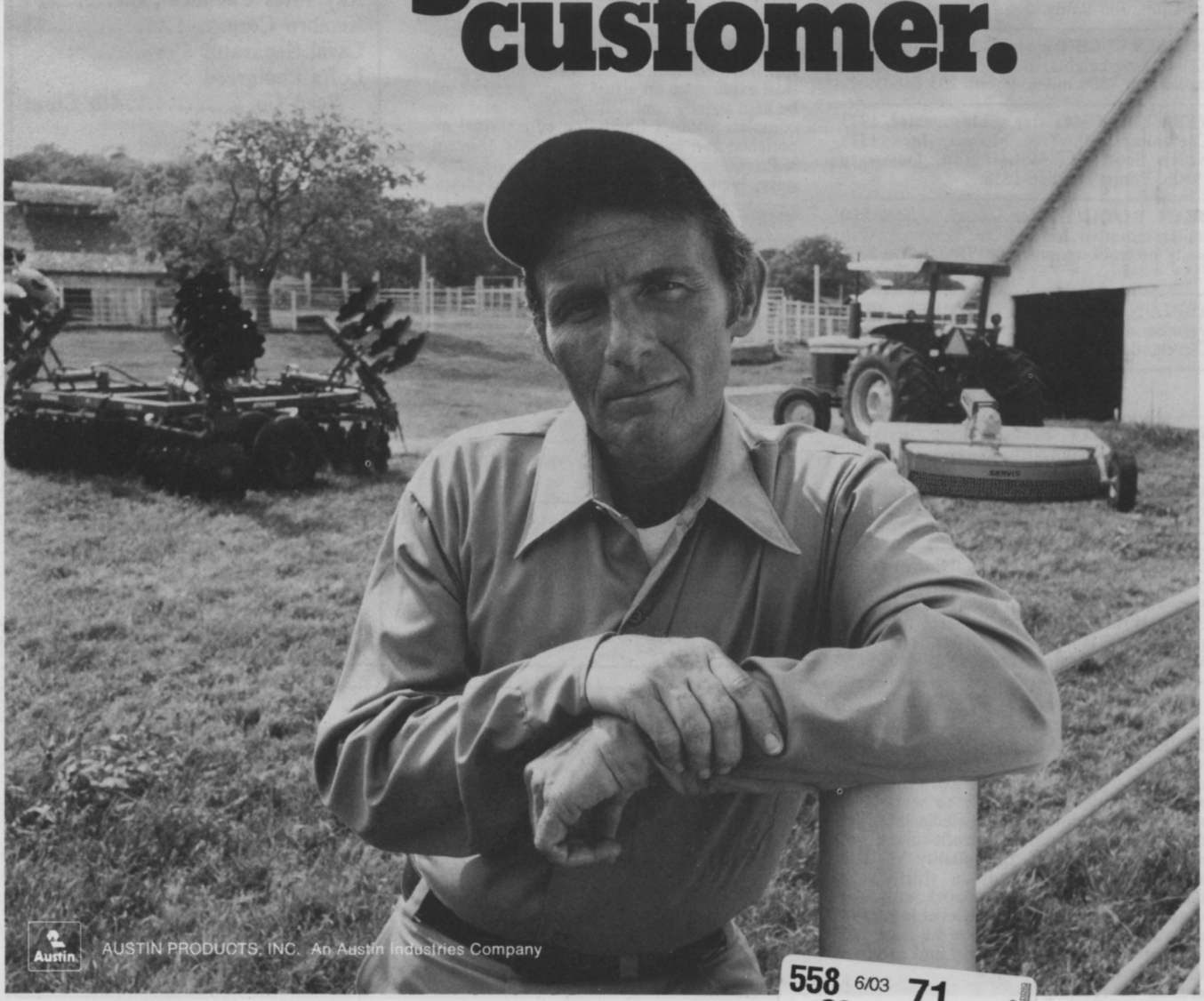

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Here's the new riding mower that thinks it's a walking mower.

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John Hoerr of D. A. Hoerr & Sons, Peoria, Illinois.

D. A. Hoerr and Sons, Peoria, Ill., raises 500 acres of sod and lays much of it through their Landscape Contractual Division at commercial, industrial, municipal and homeowner sites. James Hoerr says: "Since we began using Baron Kentucky Bluegrass, we've had less problems raising a good quality sod and even fewer problems after the sod is laid. We can't just sell sod and hope for the best. We're responsible, even after installation. We find it pays to start with the very best seed we can buy. Baron gives us a well knit sod that takes root quickly, cutting down on service calls".

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*U.S. Plant Patent #3186, Dwarf Variety

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